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GEOLOGICAL SURVEY OF ALABAMA

WALTER BRYAN JONES, STATE GEOLOGIST

BULLETIN 39

STATISTICS OF THE MINERAL PRODUCTION OF ALABAMA FOR 1928

COMPILED FROM THE MINERAL RESOURCES
OF THE UNITED STATES

BY

JELKS BARKSDALE
STAFF GEOLOGIST

UNIVERSITY, ALABAMA

JULY, 1930

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PREFACE

The statistics presented in this report were collected in cooperation with the United States Bureau of Mines, and were compiled from the tabulation sheets and advance chapters of *The Mineral Resources of the United States,* a publication of the Federal Government.

The introductory and descriptive material in each of the following sections has been condensed and rewritten so as to give special prominence to the parts dealing directly with Alabama. A general statement of the production of the United States has also been included so as to show the relative position of Alabama among the states.

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LETTER OF TRANSMITTAL

University, Ala.,
June 24, 1930.

His Excellency,
BIBB GRAVES,
Governor of Alabama,
Montgomery, Alabama.

Sir:

I have the honor to transmit herewith the manuscript of a report on Statistics of the Mineral Production of Alabama for 1928, by Jelks Barksdale, Staff Geologist, with a request that it be printed as Bulletin No. 39 of the Geological Survey of Alabama.

Very respectfully,

WALTER B. JONES,
State Geologist.

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INTRODUCTION

The mineral production of Alabama in 1928 showed an appreciable decrease both in quantity and value as compared with 1927, and was the lowest for any year since 1922. The total value of the minerals and mineral products produced in Alabama in 1928 amounted to $129,306,967, as compared with $146,290,631 in 1927, a decrease of 11.6 per cent; this value is 11.2 per cent below the ten-year average.

The only major industries to report increased outputs were clay, limestone, marble and sand and gravel; the increase in value of these products amounted to 3.4 per cent, 0.3 per cent, 66.9 per cent, and 59 per cent, respectively.

The production of coal was 10.8 per cent less than in 1927, but in spite of this decrease it remained by far the most important mineral product of the year. The coke industry showed a slight recession from the previous year; the actual decrease in production amounted to 0.84 per cent.

Iron ore, although showing a decrease of 2 per cent in quantity and 10.6 per cent in value from 1927, was next to coal the most important product of the year. The iron produced from this ore exceeded coal in value, but it must be borne in mind that pig iron is a derived rather than a natural product. The production of pig iron decreased 8.2 per cent in amount and 15.9 per cent in value as compared with 1927. Thus it is evident that the coal and iron industries, which are the backbone of Alabama's industrial structure, were less active in 1928 than in the preceding year.

The production of Portland cement — one of the most important products — was 11 per cent below the 1927 figures; the output of lime — a related product — was 6.6 per cent less than in 1927.

The graphite industry after the post-war depression was revived in 1926 and in 1927 Alabama was responsible for two-thirds of the crystalline graphite produced in the United States. The production in 1928 decreased 54.6 per cent from the preceding year, and Alabama dropped to second place among the states reporting output of this mineral.

The transportation facilities were adequate and efficient, while there have been practically no labor troubles since the coal-miners strike of 1919 and 1920. Within the past few years, many of the mills and quarries have been improved and modern equipment has been added. A number of mergers and combinations have recently been carried out, which should result in more efficient and more economical operation, and larger profits.

The table below gives the total value of the minerals and mineral products of Alabama for the years 1912 to 1928, inclusive:

Value of the minerals and mineral products of Alabama for the years 1912 *to* 1928, *inclusive*

Year	*Value*	*Year*	*Value*
1912	$60,141,793	1921	$93,358,592
1913	67,530,089	1922	119,080,586
1914	56,769,559	1923	167,734,331
1915	61,791,958	1924	151,992,772
1916	94,987,229	1925	158,052,054
1917	158,008,952	1926	161,516,375
1918	189,426,896	1927	146,290,631
1919	137,187,345	1928	129,306,967
1920	197,699,592		

The following table presents the amount and value of each mineral and mineral product produced in Alabama in 1927 and 1928, together with the rank of Alabama among the states of the United States:

Mineral production of Alabama for 1927 *and* 1928

Mineral	1927			1928		
	Quantity	*Value*	*Rank in U. S.*	*Quantity*	*Value*	*Rank in U. S.*
Asphalt Rock (tons)	32,650	$ 128,700	4	*	$ *	
Bauxite (long tons)	4,060	24,690	3	*	*	
Cement, Portland (barrels)	7,564,863	11,498,592	8	6,749,202	8,233,872	9
Clay (tons)	127,397	176,418	11	131,808	178,934	11
Clay Products		5,256,108	5		4,072,802	
Coal (tons)	19,765,866	44,524,000	5	17,621,362	39,601,000	5
Coke (tons)	4,364,354	13,500,234	3	4,327,324	13,260,178	4
Graphite, Crystalline (pounds)	3,474,000	146,730	1	1,575,500	81,750	2
Iron Ore (long tons)	6,508,419	12,973,594	3	6,307,844	11,599,176	3
Lime (tons)—						
Raw	206,010	1,566,287	5	192,364	1,407,232	5
Hydrated	31,055	232,466	13	34,376	269,727	11
Pig Iron (long tons)	2,705,240	50,196,057	5	2,525,812	42,194,935	5
Sand and Gravel (tons)	2,085,696	1,292,233	22	3,315,985	1,719,222	16
Stone (tons)—						
Marble	37,380	671,088	6	62,400	792,841	4
Limestone	1,164,130	1,079,137	17	1,167,830	1,368,315	18
Sandstone	37,240	47,150	15	30,960	36,675	15
Miscellaneous**		2,975,147			3,490,308	
Total		$146,290,631			$129,306,967	

*—Included under miscellaneous.
**—Includes asphalt rock, barite, bauxite, beehive coke, building limestone, manganese ore, mica, mineral waters, pottery, puzzolan cement and ocher.

ASPHALT ROCK

INTRODUCTION

The term *asphalt* as generally used includes the various forms of bitumen, whether found in nature or produced artificially by refining processes.

The term *asphalt rock* is commonly used to designate all rocks, whether in a solid or friable state, that contain appreciable amounts of bitumen or asphalt intermingled with the individual grains of the mother rock. Thus asphalt rock includes asphalt impregnated earths, sand, sandstone, shale and limestone, of which asphaltic limestone and sandstone are by far the most important.

Asphalt rock of varying quality occurs widely distributed throughout the United States, but the principal deposits are found in northwestern Alabama; in the western half of Kentucky; in Uvalde County, Texas; in southern Oklahoma; and in the vicinity of Vera Cruz in California.

SUMMARY OF PRODUCTION

In 1928, the producers in the United States sold at the mines 760,497 tons of native asphalt rock, valued at $4,060,276, which represents an average price of $5.35 per ton. This was a decrease from 1927 of 4.5 per cent in quantity and 13.1 per cent in value of output. The states of Texas and Kentucky together furnished 84 per cent of the total production in 1928; the other producing states were Alabama, Oklahoma, California and Utah. The asphalt rock produced in Kentucky was primarily asphalt impregnated sandstone, while the product of the other states was largely asphaltic limestone.

The total production of Alabama for the year 1928 was as asphalt impregnated, oolitic limestone from Colbert County in the northwestern part of the state. Since there were only two producers, the production cannot be given without disclosing confidential information, however, the output has been grouped with California and Oklahoma. The combined production of asphalt rock for these states in 1928 amounted to 110,360 tons, valued at $406,575.

The following table gives the native asphalt and related bitumens sold at the mines in the United States, 1924 to 1928, by varieties and by States:

Native asphalt and related bitumens sold at mines in the United States, 1924-1928, by varieties and by States

(Value f. o. b. Mine)

	1924		1925		1926		1927		1928	
	Short Tons	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*
Bituminous rock:										
Alabama	8,498	$29,743	23,550	$77,080	22,000	$101,000	32,650	$128,700	110,360	$406,575
Oklahoma	17,961	80,825	27,450	82,830	37,010	121,830	42,460	132,380		
California	3,731	14,088	2,680	16,100	3,330	19,310				
Kentucky	274,743	2,386,557	286,850	2,493,360	320,430	2,530,480	344,220	3,156,700	318,548	2,757,547
Missouri	300	3,150	------	------	------	------	------	------	------	------
Texas	220,598	779,696	204,530	692,730	289,980	825,610	376,770	1,254,500	321,505	815,482
Utah	------	------	------	------	------	------	------	------	10,084	80,672
Total bituminous rock	525,831	3,294,059	545,060	3,362,100	672,750	3,598,230	796,100	4,672,280	760,497	4,060,276
Gilsonite: Utah	35,907	603,620	39,520	767,900	42,190	863,840	42,580	876,820	47,023	1,037,679
Grahamite: Utah	60	450	------	------	------	------	------	------	------	------
Ozokerite: Utah	300	36,000	------	------	------	------	80	32,000	150	60,000
Wurtzilite: Utah	269	24,210	270	18,400	240	22,890	280	24,750	190	17,100
Grand total	562,367	3,958,339	584,850	4,148,400	715,180	4,484,960	839,040	5,605,850	807,860	5,175,055

Resume by States

	1924		1925		1926		1927		1928	
	Short Tons	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*	*Short Tons*	*Value*
Alabama	8,498	29,743	23,550	77,080	22,000	101,000	32,650	128,700	110,360	406,575
Oklahoma	17,961	80,825	27,450	82,830	37,010	121,830	42,460	132,380		
California	3,731	14,088	2,680	16,100	3,330	19,310				
Ketucky	274,743	2,386,557	286,850	2,493,360	320,430	2,530,480	344,220	3,156,700	318,548	2,757,547
Missouri	300	3,150	------	------	------	------	------	------	------	------
Texas	220,598	779,696	204,530	692,730	289,980	825,610	376,770	1,254,500	321,505	815,482
Utah	36,536	664,280	39,790	786,300	42,430	886,730	42,940	933,570	57,447	1,195,451
Grand total	562,367	3,958,339	584,850	4,148,400	715,180	4,484,960	839,040	5,605,850	807,860	5,175,055

PETROLEUM ASPHALT

Petroleum asphalt, a by-product from the refining of asphalt base crude oils, offers strong competition to the native asphalt rocks. In 1928, the producers sold at the refineries 1,741,392 tons of petroleum asphalt from domestic petroleum, valued at $20,425,371, and 2,264,137 tons from foreign petroleum, valued at $29,687,614.

NATURAL ASPHALTS

Natural asphalts — gilsonite, grahamite, ozokerite and wurtzerite — have proved to be of commercial importance, and may be used for the same purposes as the native asphalt rocks. These minerals are produced primarily in Utah and Oklahoma.

ALABAMA PRODUCERS

Alabama Rock Asphalt Co., 310 Pioneer Building, Birmingham. Quarry at Margerum, Colbert County.

Colbert Limerock Asphalt Co., Cherokee. Quarry at Cherokee, Colbert County.

BAUXITE

SUMMARY OF PRODUCTION

Several deposits of bauxite in the Eufaula district, Barbour and Henry counties, were developed during 1926. In 1927 there were three producers in the district, but in 1928 the number had dropped to two. Since there were less than three producers in 1928, the output cannot be published without disclosing confidential information, however, the value is included in the state total. The combined output of Alabama, Georgia and Tennessee in 1928 amounted to 14,190 long tons, valued at $80,668, a decrease of 17 per cent in quantity and 15.9 per cent in value as compared with 1927.

The bauxite produced in Alabama in 1928 was used in the manufacture of abrasives, chemicals and aluminum. The relative amount used for each purpose was in the order named.

The production of bauxite in the United States for the year 1928 amounted to 375,426 long tons, valued at $2,273,898, an increase over 1927 of 17 per cent in amount and 14.3 per cent in value of output. Of this production, Arkansas was responsible for 361,236 long tons, valued at $2,193,230. A large part of this tonnage was used in the manufacture of aluminum, although smaller amounts went into the manufacture of alumina cement, alumina abrasives, alumina refractories and aluminum chemicals.

The following table gives the amount and value of the bauxite produced in the United States for the years 1919 to 1928, inclusive, by states:

Bauxite produced in the United States, 1919-1928

Year	*Georgia, Alabama and Tennessee*		*Arkansas*		*Total*	
	Long Tons	*Value*	*Long Tons*	*Value*	*Long Tons*	*Value*
1919	43,076	$346,588	333,490	$1,855,159	376,566	$2,201,747
1920	40,029	349,453	481,279	2,897,892	521,308	3,247,345
1921	14,700	134,400	124,850	755,400	139,550	889,800
1922	42,810	329,440	266,790	1,682,890	309,600	2,012,330
1923	29,810	176,030	493,880	2,980,580	522,690	3,156,610
1924	19,940	156,990	327,630	1,981,000	347,570	2,137,990
1925	20,220	109,800	296,320	1,878,450	316,540	1,988,250
1926	20,680	116,650	371,570	2,298,550	392,250	2,415,200
1927	17,110	95,920	303,830	1,892,860	320,940	1,988,780
1928	14,190	80,668	361,236	2,193,230	375,426	2,273,898

ALABAMA PRODUCERS

Republic Mining and Manufacturing Co., Eufaula. Mine at Richards Cross Roads, Barbour County.

William J. Crouch Mining Co., Eufaula. Mine at Davis Hill, Henry County.

CEMENT

SUMMARY OF PRODUCTION

Two types of cement were produced in Alabama in 1928—Portland and puzzolan or slag-lime cement. There were six producers of Portland cement in Alabama in 1928, with a total output of 6,749,202 barrels, a decrease from 1927 of 11 per cent. Of this output 6,696,684 barrels, valued at $8,233,872 were sold by the producers. This represents an average factory price per barrel of $1.23, as compared with $1.45 in 1927. The stock on hand at the end of 1928 was 707,542 barrels, an increase of 8 per cent over the preceding year.

Since there was only one producer of puzzolan or slag-lime cement in Alabama in 1928, the actual output cannot be given without disclosing confidential information, however, the value of the product is given under *miscellaneous*, and is thus included in the state total.

The production of Portland cement in the United States in 1928—176,298,846 barrels—was the largest quantity manufactured in any year and exceeded that in 1927, the next highest year in production, by two per cent. Of this output 175,838,332 barrels, valued at $275,972,945 were shipped from the mills, which was an increase of two per cent in quantity, but a decrease of one per cent in value, as compared with 1927.

The production of masonry, natural and puzzolan cement in the United States for 1928 amounted to 2,210,404 barrels, and 2,213,645 barrels, valued at $2,910,097 were shipped from the mills during the year. This production exceeded that in 1927 by 4.07 per cent, while the shipments showed an increase of 2.56 per cent over 1927. Eleven plants were responsible for the entire output.

The following table gives at a glance the production, shipment, stock, and value of Portland cement in the United States in 1928, by states:

Portland cement produced, shipped, and in stock in the United States, 1927-28, by states

State	Production: Active Plants 1927	Production: Active Plants 1928	Production: Barrels 1927	Production: Barrels 1928	Increase or Decrease, 1928 (per cent)	Shipments 1927: Barrels	Shipments 1927: Value	Shipments 1928: Barrels	Shipments 1928: Value	Average Factory Value per Barrel 1927	Average Factory Value per Barrel 1928	Increase or Decrease in Quantity, 1928 (per cent)	Stock (Dec. 31) Barrels 1927 (Revised)	Stock (Dec. 31) Barrels 1928	Increase or Decrease, 1928 (Per Cent)
Alabama	6	6	7,564,863	6,749,202	—11	7,313,494	$10,615,428	6,696,684	$8,233,872	$1.45	$1.23	—8	655,024	707,542	+8
California	12	12	14,580,654	13,555,579	—7	14,433,153	26,623,396	13,699,851	25,906,942	1.84	1.89	—5	840,506	696,234	—17
Illinois	4	4	7,017,047	7,334,833	+5	7,061,240	11,312,783	7,405,667	11,602,848	1.60	1.57	+5	768,275	697,441	—9
Iowa	5	6	5,415,144	7,070,172	+31	5,661,234	9,124,405	6,880,731	10,734,838	1.61	1.56	+22	1,370,481	1,559,922	+14
Kansas	7	7	6,180,255	6,574,219	+6	6,141,937	9,939,412	6,787,568	10,091,330	1.62	1.49	+11	1,137,286	923,937	—19
Michigan	15	14	13,965,241	13,848,561	—1	13,708,259	20,858,202	14,044,230	19,268,707	1.52	1.37	+2	2,206,202	2,010,533	—9
Missouri	5	5	6,778,384	7,881,118	+16	6,929,229	11,117,047	7,943,367	12,367,018	1.60	1.56	+15	957,053	894,804	—7
Ohio	10	10	8,853,869	9,233,033	+4	8,727,879	14,242,901	9,364,338	14,928,183	1.63	1.59	+7	1,205,379	1,074,074	—11
Pennsylvania	25	26	43,732,278	41,522,401	—5	42,909,513	66,711,069	41,161,019	62,572,588	1.55	1.52	—4	5,868,169	6,229,551	+6
Tennessee	5	6	4,430,439	4,689,703	+6	4,343,337	6,580,732	4,634,280	6,322,213	1.52	1.36	+7	515,245	570,668	+11
Texas	7	7	5,655,835	6,345,604	+12	5,692,350	10,232,908	6,231,083	10,938,646	1.80	1.76	+9	407,403	521,924	+28
Other States*	52	53	49,032,504	51,494,421	+5	48,943,103	81,496,364	50,989,514	83,005,760	1.67	1.63	+4	6,526,359	7,031,266	+8
District	153	156	173,206,513	176,298,846	+2	171,864,728	278,854,647	175,838,332	275,972,945	1.62	1.57	+2	22,457,382	22,917,896	+2

* Includes Colorado, Florida, Georgia, Indiana, Kentucky, Louisiana, Maine, Maryland, Minnesota, Montana, Nebraska, New Jersey, New York, Oklahoma, Oregon, South Dakota, Utah, Virginia, Washington, West Virginia and Wisconsin.

FUELS

The fuel used in Alabama in 1928 for burning cement was primarily powdered coal, but with the recent completion of a high pressure natural gas line into the state, it seems likely that this gas will be used more and more in the future.

ALABAMA PRODUCERS

PORTLAND CEMENT

Alpha Portland Cement Co., Birmingham. Mill at Phoenixville, Jefferson County.

Atlas Portland Cement Co., New York, N. Y. Mill at Leeds, Jefferson County.

Lehigh Portland Cement Co., Allentown, Penn. Mill at North Birmingham, Jefferson County.

Lone Star Cement Company of Alabama, Birmingham. Mill at North Birmingham, Jefferson County.

Lone Star Cement Company of Alabama, Birmingham. Mill at Spocari, Marengo County.

National Cement Co., Birmingham. Mill at Ragland, St. Clair County.

PUZZOLAN CEMENT

Southern Cement Co., Birmingham. Mill at North Birmingham, Jefferson County.

CLAY

SUMMARY OF PRODUCTION

The clay sold or used by producers in Alabama in 1928 amounted to 131,808 tons, valued at $178,934, as compared with 127,397 tons, valued at $176,418 in 1927. This represents an increase of 3.4 per cent in amount and 1.4 per cent in value over 1927. Of this output, 124,592 tons, valued at $173,206 were fire clay, and 7,216 tons, valued at $5,728 were classed as miscellaneous clay.

The chief use of fire clay is in the manufacture of refractories; these products are consumed almost entirely in the iron and steel and coke industries of the state for the construction and maintenance of furnaces and ovens. Under miscellaneous clay are included a number of varieties, but in Alabama the output listed under this head is primarily a low grade clay used in the manufacture of heavy clay products such as building and drainage materials.

Up to the present time, ceramic industries have not been established on a large scale in this state, although they have shown steady and substantial growth in recent years. The Geological Survey of Alabama is now preparing an extensive report on the clays of the state which, it is believed, will result in their more extensive development and the establishment of a substantial ceramic industry in the state.

The clay sold by producers in the United States in 1928 amounted to 4,026,332 tons, valued at $14,200,739, an increase of 4.6 per cent in quantity and 3.6 per cent in value, as compared with 1927. Each kind of clay as classified in this report except slip clay and stoneware clay increased in quantity as compared with 1927, and each kind except slip clay and fire clay increased in value. Kaolin and ball clay were the only kinds to reach maximum quantity and value in 1928. The steady increase in sales of high grade domestic clays and the decrease in imports indicate that the domestic clays are gradually replacing the imported materials, which were formerly used almost exclusively.

The accompanying tables of production and the figures given above do not include the clay burned into clay products by the producers themselves unless it was mined under royalty or was shipped out of the state from which it was mined. This accounts for the great difference between the value of raw clay and the value of the manufactured products in Alabama since most of the larger manufacturers of clay products mine the raw clay from their own deposits.

Clay sold by producers in the United States in 1928, by States and kinds

State	Number of Operators Reporting Sales	Kaolin or China Clay and Paper Clay		Ball Clay		Fire Clay		Stoneware Clay		Miscellaneous Clay †		Total	
		Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Alabama	13	—	—	—	—	124,592	$ 173,206	—	—	7,216	$5,728	131,808	$178,934
Arizona	1	—	—	—	—	—	—	—	—	11,473	45,892	11,473	45,892
Arkansas	1	—	—	—	—	266	1,064	—	—	—	—	266	1,064
California	40	800	$10,873	3,667	$17,252	205,990	511,916	1,312	$5,493	127,728	418,309	339,497	963,843
Colorado	18	—	—	—	—	70,110	167,500	—	—	84,965	89,048	155,075	256,548
Connecticut	2	—	—	—	—	329	4,277	—	—	450	1,350	779	5,627
Delaware	2	5,638	84,736	—	—	—	—	—	—	—	—	5,638	84,736
Florida	4	46,496	630,471	—	—	—	—	—	—	—	—	46,496	630,471
Georgia	17	234,028	1,668,125	—	—	15,486	19,439	90	90	—	—	249,604	1,687,654
Idaho	2	—	—	—	—	494	6,095	—	—	—	—	494	6,095
Illinois	23	—	—	*	*	224,322	404,071	21,220	35,970	*	*	248,618	466,290
Indiana	13	—	—	—	—	132,087	163,430	—	—	38,425	38,785	170,512	202,215
Iowa	5	—	—	—	—	2,833	21,900	—	—	1,221	1,600	4,054	23,500
Kentucky	18	—	—	53,204	460,778	*	*	—	—	*	*	149,317	757,505
Maine	3	—	—	—	—	89	1,780	—	—	84	104	173	1,884
Maryland	11	—	—	*	*	7,119	34,184	—	—	*	*	60,762	91,547
Massachusetts	7	—	—	—	—	*	*	—	—	*	*	2,158	11,848
Michigan	5	—	—	—	—	—	—	—	—	3,805	6,949	3,805	6,949
Minnesota	5	—	—	—	—	—	—	17,727	39,886	839	3,687	18,566	43,573
Mississippi	1	—	—	—	—	—	—	1,320	2,310	—	—	1,320	2,310
Missouri	32	—	—	1,440	10,080	420,586	1,425,564	4,000	7,000	—	—	426,026	1,442,644
Montana	3	—	—	—	—	11,954	63,032	—	—	12,589	10,071	24,543	73,103
Nebraska	5	—	—	—	—	132	538	—	—	19,020	19,193	19,152	19,731
Nevada	4	918	7,855	—	—	—	—	—	—	12,591	53,668	13,509	61,523
New Jersey	38	—	—	11,377	74,073	212,514	963,609	13,082	61,390	23,769	34,776	260,742	1,133,848
New Mexico	5	—	—	—	—	5,338	6,597	—	—	—	—	5,338	6,597
New York	6	—	—	—	—	*	*	—	—	*	*	7,214	37,201
North Carolina	5	19,788	298,841	—	—	*	*	*	*	—	—	19,898	298,951
North Dakota	2	12	192	—	—	25	100	—	—	7	140	44	432
Ohio	64	—	—	—	—	269,689	692,706	27,536	40,895	6,460	18,706	303,685	752,307
Oregon	2	—	—	—	—	*	*	*	*	—	—	*	*
Pennsylvania	90	71,552	383,675	—	—	865,024	2,100,469	*	*	*	*	971,148	2,532,105
South Carolina	11	106,828	925,801	—	—	2,258	73,902	—	—	100	400	109,186	1,000,103

Clay sold by producers in the United States in 1928, by States and kinds—Continued

State	Number of Operators Reporting Sales	Kaolin or China Clay and Paper Clay		Ball Clay		Fire Clay		Stoneware Clay		Miscellaneous Clay †		Total	
		Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
South Dakota	1									1,066	10,660	1,066	10,666
Tennessee	9			39,851	370,181	*	*	*	*	30,776	39,574	123,587	613,554
Texas	9					2,651	16,803			507	2,028	3,158	18,831
Utah	6					*	*			*	*	24,897	156,951
Vermont	1	*	*									*	*
Virginia	3	*	*			746	2,717			*	*	9,970	71,147
Washington	7					5,906	18,925	*	*	*	*	35,041	39,632
West Virginia	6					41,836	66,621					41,836	66,621
Wisconsin	2									508	983	508	983
Wyoming	7					3	24			22,918	383,970	22,921	383,994
Undistributed		10,082	77,434	11,339	51,711	162,779	540,140	9,339	14,241	122,011	255,156	2,448	11,336
	509	496,142	4,088,003	120,878	984,075	‡2,785,158	‡7,480,609	95,626	207,275	§528,528	§1,440,777	4,026,332	14,200,739
Aver. value per ton			8.24		8.14		2.69		2.17				3.53

†—Includes ardmorite, bentonite, shale, etc. Slip clay is also included in this column as a matter of statistical convenience.
*—Included under "Undistributed."
‡—These totals include 37,439 tons of diaspore and burley clay from Missouri, valued at $207,155.
§—These totals include 5,699 tons of slip clay from Michigan and New York, valued at $30,796, or $5.40 a ton.

CLAY PRODUCTS

The value of the clay products exclusive of pottery manufactured in Alabama in 1928 was $4,072,802 as compared with $5,258,108 in 1927, a decrease of 22.54 per cent.

ALABAMA PRODUCERS OF CLAY

Bibbville Fire Brick and Manufacturing Co., Ensley. Mine at Bibbville, Bibb County.

Lehigh Coal Co., Lehigh. Mine at Lehigh, Blount County.

American Bentonite Co., Anniston. Mine at Eastaboga, Calhoun County.

Southern Refractories Co., Fort Payne. Mine at Fort Payne, DeKalb County.

Alabama By-Products Corporation, Birmingham. Mine at Dixiana, Jefferson County.

Alabama Clay Products Co., Birmingham. Mine at Bessemer, Jefferson County.

Bibby Coal, Shale and Clay Co., Littleton. Mine at Littleton, Jefferson County.

Birmingham Clay Products Co., Birmingham. Mine at Warrior, Jefferson County.

Black Creek Coal and Coke Co., Trafford. Mine at Trafford, Jefferson County.

Harbison-Walker Refractories Co., Pittsburgh, Penn. Mine at Fairfield, Jefferson County.

Robertson Brick Co., Birmingham. Mine at East Birmingham, Jefferson County.

Foote Products Co., Heflin. Mine at Heflin, Randolph County.

Riverside Clay Co., Birmingham. Mine at Riverside, St. Clair County.

Anniston Refractories Co., Jacksonville. Mine at Silver Run, Talladega County.

Silver Run Clay Co., Fairfield. Mine at Silver Run, Talladega County.

W. C. Shackleford, Green Pond. Mine at Giles, Tuscaloosa County.

J. M. Hicks, Delmar. Mine at Delmar. Winston County.

COAL

SUMMARY OF PRODUCTION

The coal produced in Alabama in 1928—all of bituminous rank—amounted to 17,621,362 tons, valued at $39,601,000, as compared with 19,765,866 tons, valued at $44,524,000 in 1927. The average value of this coal at the mines remained the same as in 1927—$2.25 per ton.

Eleven counties contributed to the output. Jefferson County supplied 8,379,841 tons or approximately one-half of the total output, while Walker County produced 4,827,751 tons or approximately one-fourth of the total. The remaining one-fourth was distributed among Bibb, Blount, Etowah, St. Clair, Fayette, Marion, Shelby and Tuscaloosa counties, of which Bibb was by far the leading producer.

Size of Mines. There were 212 active mines of commercial size in operation in Alabama in 1928, as compared with 231 in 1927, and 227 in 1926. Four of these mines produced 500,000 tons or more each or 16.6 per cent of the total tonnage; sixteen mines produced between 200,000 and 500,000 tons each or 27.8 per cent of the total; thirty-two mines produced between 100,000 and 200,000 tons each or 25.3 per cent of the total; fifty-one mines produced between 50,000 and 100,000 tons each or 21.5 per cent of the total; fifty-four mines produced between 10,000 and 50,000 tons each or 7.7 per cent of the total; and fifty-five mines produced less than 10,000 tons each or 1.1 per cent of the total.

Methods of Mining. The methods of mining employed in the coal mines of Alabama in 1928 are given below, together with the tonnage of coal produced by each method: The coal mined by hand amounted to 1,896,767 tons; that shot off the solid, 4,136,496 tons; that cut by machines, 11,241,623 tons; and that mined by stripping, 333,186 tons. The remaining 13,290 tons were not specified.

Uses. Of the coal produced in Alabama in 1928, 6,215,804 tons or 35.27 per cent of the total were used in the manufacture of coke; 190,843 tons or 1.08 per cent were used at the mines for steam and heat; 433,581 tons or 2.46 per cent were sold to the local trade; and the remainder, 10,781,134 tons or 61.18 per cent were shipped from the mines for domestic and commercial uses.

The following table gives detailed statistics of the coal produced in Alabama in 1928, by counties:

Production, value, men employed, days worked, and output per man per day at coal mines in Alabama, in 1928*

(Exclusive of product of wagon mines producing less than 1,000 tons)

County	Net Tons					Value		Number of Employes					Average Number of Days Worked	Average Tons per Man per Day
								Underground						
	Loaded at Mines for Shipment	Sold to Local Trade and Used by Employes	Used at Mines for Steam and Heat	Made Into Coke at Mines	Total Quantity	Total	Average per Ton	Miners, Loaders, Shot Firers	Haulage and Track	All Others	Surface	Total		
Bibb	1,129,807	6,638	17,535	....	1,153,980	$ 2,863,000	$ 2.48	1,189	153	251	284	1,877	211	2.92
Blount	340,455	8,753	8,093	....	357,301	803,000	2.25	438	91	25	120	674	211	2.51
Etowah and St. Clair	728,966	5,283	37,984	....	772,233	1,705,000	2.21	525	74	87	124	810	232	4.11
Fayette and Marion	341,888	4,065	300	....	346,253	1,016,000	2.93	398	56	45	93	592	210	2.79
Jefferson	8,379,841	136,976	110,858	....	8,627,675	19,946,000	2.31	6,940	1,409	1,796	1,673	11,818	246	2.96
Shelby	651,567	30,257	759	....	682,583	2,246,000	3.29	1,008	149	86	258	1,501	240	1.89
Tuscaloosa	592,613	9,346	1,220	....	603,179	1,385,000	2.30	682	125	89	185	1,081	217	2.57
Walker	4,827,751	230,645	14,094	....	5,072,490	9,624,000	1.90	4,368	933	811	1,215	7,327	184	3.75
Winston	4,050	1,618	....	....	5,668	13,000	2.29	18	2	2	6	28	136	1.49
	16,996,938	433,581	190,843	....	17,621,362	39,601,000	2.25	15,566	2,992	3,192	3,958	25,708	222	3.09

*—The figures relate only to active mines of commercial size that produced coal in 1928.

The production of bituminous coal in the United States in 1928 amounted to 500,744,970 tons, valued at $933,774,000, a decrease from 1927 of 3.28 per cent in amount and 8.36 per cent in value of output. The average price of this coal at the mines was $1.86 per ton, as compared with an average value of $1.99 per ton in 1927.

Thus it is evident that the coal mining industry of the United States, as well as that of Alabama, was less active in 1928 than in the preceding year, and that the average value per ton of the coal also decreased in the same period.

There were 6,450 active commercial mines in the United States in 1928 engaged in the production of bituminous coal, as compared with 7,011 mines in 1927. Of the total output, 71,040,606 tons were mined by hand; 39,149,230 tons were shot from the solid; 369,687,007 tons were cut by machines; 19,788,577 tons were mined by stripping; and 1,079,550 tons were not specified. There were 152 mines in Class 1-A (500,000 tons and over) which produced 23.3 per cent of the total output; 621 mines in Class 1-B (200,000 to 500,000 tons) which produced 37.4 per cent of the total; 687 mines in Class 2 (100,000 to 200,000) which produced 19.4 per cent of the total; 725 Class 3 (50,000 to 100,000 tons) which produced 10.4 per cent of the total; 1,513 in Class 4 (10,000 to 50,000 tons) which produced 7.7 per cent of the total; and 2,752 in Class 5 (less than 10,000 tons) which produced 1.8 per cent of the total.

The following table gives detailed statistics of the coal production of the United States in 1928 by states:

Production, value, men employed, days worked, and output per man per day at coal mines in the United States, in 1928

(Exclusive of product of wagon mines producing less than 1,000 tons)

State	Net Tons					Value		Number of Employes					Average Number of Days Worked	Average Tons per Man per Day
								Underground						
	Loaded at Mines for Shipment	Sold to Local Trade and Used by Employes	Used at Mines for Steam and Heat	Made Into Coke at Mines	Total Quantity	Total	Average per Ton	Miners, Loaders, and Shot Firers	Haulage and Track	All Others	Surface	Total		
Alabama	16,996,938	433,581	190,843		17,621,362	$ 39,601,000	$ 2.25	15,566	2,992	3,192	3,958	25,708	222	3.09
Arkansas	1,627,550	15,010	18,413		1,660,973	5,615,000	3.38	2,620	432	379	661	4,092	146	2.79
Colorado	8,621,540	795,155	196,866	234,146	9,847,707	27,613,000	2.80	7,994	1,463	1,097	1,812	12,366	193	4.13
Georgia	56,487	596	259	1,048	58,390	181,000	3.10				124	124	280	1.68
Illinois	51,513,409	3,672,205	762,585		55,948,199	112,095,000	2.00	43,718	7,130	6.681	6,737	*64,266	156	*5.51
Indiana	15,488,382	564,930	325,268		16,378,580	29,212,000	1.78	9,967	1,859	1,735	3,245	16,806	150	6.51
Iowa	2,849,348	781,390	52,897		3,683,635	10,525,000	2.86	5,055	766	644	500	6,965	175	3.02
Kansas	2,433,549	335,739	40,436		2,809,724	6,861,000	2.44	4,153	446	261	1,131	5,991	128	3.68
Kentucky	60,454,706	884,996	454,818	65,859	61,860,379	96,722,000	1.56	37,801	7,383	8,460	8,551	62,195	212	4.69
Maryland	2,564,099	111,297	11,583		2,686,979	4,954,000	1.84	2,225	387	311	381	3,304	233	3.50
Michigan	566,587	7,637	43,118		617,342	2,631,000	4.26	818	174	127	120	1,239	187	2.67
Missouri	3,196,405	464,703	71,313		3,732,421	9,637,000	2.58	3,697	421	448	1,398	5,964	180	3.47
Montana	3,169,415	109,930	44,850		3,324,195	7,550,000	2.27	1,319	282	200	390	2,191	191	7.93
New Mexico	2,604,467	50,495	56,889		2,711,851	8,636,000	3.18	2,142	377	319	603	3,441	213	3.70
North Carolina	51,740	5,900	3,220		60,860	201,000	3.30	160	32	16	32	240	180	1.41
North Dakota	1,319,721	311,936	18,273		1,649,930	2,780,000	1.68	803	78	55	399	1,335	177	7.00
Ohio	12,786,442	2,706,600	148,183		15,641,225	26,439,000	1.69	14,151	1,937	2,317	2,966	21,371	171	4.28
Oklahoma	3,343,042	108,339	49,944		3,501,325	10,365,000	2.96	3,796	662	631	1,129	6,218	169	3.34
Pennsylvania, bituminous	117,785,042	7,055,988	1,211,269	5,149,864	131,202,163	249,895,000	1.90	90,036	13,588	13,729	16,061	133,414	218	4.52
Tennessee	5,279,223	91,880	66,200	173,656	5,610,959	9,694,000	1.73	4,951	930	818	1,150	7,849	226	3.16
Texas	1,141,370	21,087	19,577		1,182,034	1,589,000	1.34	974	161	113	214	1,462	203	3.99
Utah	4,713,408	53,489	26,534	49,113	4,842,544	12,253,000	2.53	2,071	417	323	541	3,352	191	7.57
Virginia	11,371,792	111,853	39,130	378,158	11,900,933	20,375,000	1.71	6,293	1,766	2,445	1,808	12,312	226	4.28

Washington	2,339,921	116,897	33,730	29,353	2,519,901	$ 8,720,000	$ 3.46	1,951	284	367	497	3,099	220	3.70
West Virginia	128,671,064	3,020,027	537,043	724,025	132,952,159	211,480,000	1.59	64,045	16,589	15,197	15,902	111,733	223	5.35
Wyoming	6,264,930	130,695	176,058	....	6,571,683	17,363,000	2.64	2,912	686	432	813	4,843	214	6.34
Other State and Alska	137,338	27,269	2,910	....	167,517	787,000	4.70	146	17	40	67	270	194	3.20
Total Bituminous	467,347,915	21,989,624	4,602,209	6,805,222	†500744970	933,774,000	1.86	329,364	61,259	60,337	71,190	522,150	203	4.73
Pennsylvania anthracite	66,487,600	3,184,826	5,675,643	....	75,348,069	393,638,000	5.22	81,627	16,183	26,086	36,785	160,681	217	2.17
Grand Total	533,835,515	25,174,450	10,277,852	6,805,222	576,093,039	1,327,412,000	2.30	410,991	77,442	86,423	107,975	682,831	206	4.10

*—The figures of 5.57 tons per man per day for Illinois is not comparable with earlier years although computed in exactly the same way. It is obtained by dividing the tonnage produced by the total number of man-days worked, the latter being calculated for each mine by multiplying the average number of men employed by the number of days that the mine worked. This method of calculation is the best one feasible in the light of the records kept by the majority of American coal operators and the results are generally comparable from year to year. In Illinois during 1928, however, some operators installing mechanical loading for the first time pursued the practice of dividing up the work among the men already on their payrolls in order to avoid discharging men. For this reason the number of men reported as employed in 1928—64,266—is considerably in excess of the number actually at work on any one day. Were it possible to allow for this fact, the output per man per day would appear materially higher than 5.57 tons. Even so, it shows a notable increase over the 5.36 tons reported in 1927.

†—The figures relate only to active mines of commercial size that produced bituminous coal in 1928.

PENNSYLVANIA ANTHRACITE

The production of Pennsylvania anthracite in 1928 amounted to 75,648,069 tons, valued at $393,638,000, a decrease of 5.92 per cent in amount and 6.48 per cent in value of output, as compared with 1927. The average value of this coal at the mine was $5.22 a ton, or five cents per ton less than in 1927.

ALABAMA PRODUCERS

Operator	*Address*	*Mine*
	Bibb County	
Alabama Blocton Coal Co.	Oakman	Blocton
Bessemer Coal, Iron and Land Co.	Birmingham	Belle Ellen
Blocton-Cahaba Coal Co.	Coleanor	Coleanor
Blocton Mining Co.	West Blocton	Klondye
Blocton Red Ash Coal Co.	Blocton	Blocton
Bowen and Dailey	Belle Ellen	Bowen
J. H. Clifton	Belle Ellen	No. 7
Continental Coal Co.	Birmingham	Continental
Hills Creek Mining Co.	West Blocton	Hills Creek
Little Cahaba Coal Co.	Piper	Piper
Masena Cahaba Coal Co.	Masena	Belle Ellen
McCherrey Coal Co.	Marvel	Gamsey
Moffat Coal Co.	St. Louis, Mo.	Dixie
Roden Coal Co.	Marvel	Marvel
Tennessee Coal, Iron & R. R. Co.	Birmingham	Blocton
	Blount County	
Black Creek Coal and Coke Co.	Trafford	Thermal
Gulf States Steel Co.	Birmingham	Altoona
J. M. Kirkwood	Birmingham	Fairchilds
Lehigh Coal Co.	Lehigh	Lehigh
Little Black Warrior Coal Co.	Birmingham	Fairchilds
Moss and McCormack	Birmingham	Carbon Nyota
Phillips and Hartley	Altoona	Taits Gap
T. G. Shirley Coal Co.	Altoona	Taits Gap
E. B. Wadsworth	Oneonta	Wadsworth
Youngstown Mining Co.	Oneonta	Armistead
	Etowah County	
J. B. Sullivan	Vanzandt	Vanzandt
	Fayette County	
Moss and McCormack	Birmingham	Howard

Operator	*Address*	*Mine*
	Jefferson County	
Alabama By-Products Corporation	Birmingham	Banner
		Bradford
		Dixiana
		Praco
		Majestic
		New Pratt
Allan Coal Co.	Pratt City	Allan
American Fuel and Clay Products Co.	Beltona	Jefferson
Alabama Fuel and Iron Co.	Birmingham	Overton
		Jefferson
Black Creek Coal and Coke Co.	Trafford	Thermal
Black Diamond Coal Mining Co.	Birmingham	Adger
		Apache
		Oswego
Birmingham Clay Products Co.	Birmingham	Langley
Birmingham Trussville Iron Co.	Birmingham	Labuca
Birmingham Water Works Co.	Birmingham	No. 3 Cahaba
Blossburg Mining Co.	Blossburg	Buckeye
Cahaba Red Ash Coal Co.	Bessemer	Scott and Jones
Cahaba River Coal Co.	Birmingham	Jere Gwin
Cahaba Valley Coal Co.	Birmingham	Robertson
Central Alabama Coal Co.	Kimberly	Kimberly
Coalburg Mining Co.	Coalburg	Five Mile Creek
County Coal Company of Alabama, Inc.	Carnegie, Penn.	Billy
Crescent Coal Co.	Warrior	Seloca
East Pratt Coal Co.	Birmingham	Clift
Etter Coal Co.	Warrior	El Vista
Flat Creek Coal Mining Co.	Quinton	North Labuca
Franklin Coal Mining Co.	Birmingham	Powhatan
Gulf States Steel Co.	Birmingham	Sayre
		Virginia
Henry Ellen Coal Co.	Leeds	Henry Ellen
Lee and Kinkaid Coal Co.	Leeds	Riley
Markeeta Coal Co.	Birmingham	Carbo
Morris Coal Co.	Morris	Fedora
Muir-Pratt Coal Co.	Pratt City	Holt
Neil Coal Co.	Birmingham	Coalburg
New Castle Coal Co.	Birmingham	Newcastle
New Found Creek Coal Co.	Morris	Eulamo
North Birmingham Coal Co.	Sayreton	O'Hare
North Pratt Coal Co.	Birmingham	Hill House
Parkwood-Cahaba Coal Co.	Birmingham	Parkwood
Porter Coal Co.	Adamsville	Porter
Republic Iron and Steel Co.	Birmingham	Palos
		Sayreton
		Warner
		Thompson
Rogers-Talty Coal Co.	Warrior	Pritchett
		Watts
Shades Valley Coal Co.	Birmingham	Shades Valley
Sloss, Sheffield Steel and Iron Co.	Birmingham	Bessie
		Blossburg
		Flat Top
		Lewisburg
H. P. Stith	Birmingham	Coalburg

Operator	*Address*	*Mine*
Tennessee Coal, Iron and R. R. Co.	Birmingham	Docena
		Edgewater
		Hamilton Slope
		Pratt
		Wylam
P. G. Wood	Tarrant	Burgin
Woodward Iron Co.	Birmingham	Dolomite
		Mulga
	Marion County	
J. B. Bell	Parrish	Glen Mary
Brilliant Coal Co.	Birmingham	Brilliant
Brookside-Pratt Mining Co.	Birmingham	New River
	St. Clair County	
Alabama Fuel and Iron Co.	Birmingham	Acmar
		Margaret
		New Acton
	Shelby County	
Little Gem Coal Co.	Birmingham	Dogwood
Milan and McEnisy	Helena	Acton Basin
Montevallo Coal Mining Co.	Birmingham	Montevallo
Montevallo-Straven Coal Co.	Straven	Straven
Peerless-Cahaba Coal Co.	Straven	Peerless Cahaba
Premier Coal Co.	Helena	Premier
Straven Coal Mining Co.	Birmingham	Straven
Southern Coal and Coke Co.	Boothton	Boothton
		Climax
West Helena Coal Co.	Birmingham	Sicard
	Tuscaloosa County	
Aetna Coal Co.	Birmingham	Aetna
Alco Coal Co.	Tuscaloosa	Fleetwood
Big Sandy Coal and Iron Co.	Birmingham	Cedar Cove
Boyd Coal Co.	Tuscaloosa	Shiras-Boyd
Central Iron and Coal Co.	Holt	Kellerman
Davis Creek Coal and Coke Co.	Birmingham	Rockcastle
Hallman Coal Co.	Tuscaloosa	Sweetwater
Monroe Coal Co.	Tuscaloosa	Northport
Riverview Coal Co.	Tuscaloosa	Rice
		Mabel
Yolande Coal and Coke Co.	Birmingham	Yolande
	Walker County	
Alabama By-Products Corporation	Birmingham	Barney
		Gamble
		Ruby
		Wegra
Alta Coal Co.	Summiton	Summit
Armor Mining Co.	Oakman	Armor
Baker Coal Co.	Tuscaloosa	Baker
Benoit Coal Mining Co.	Birmingham	Benoit

Operator	*Address*	*Mine*
Bertha Coal Co.	Parrish	Bertha
		Blue Mountain
Brilliant Coal Co.	Birmingham	Calumet
Brookside-Pratt Mining Co.	Birmingham	Carbon Hill
Cane Creek Mining Co.	Birmingham	Bankhead
Cedrom Coal Co.	Townley	Cedrom
DeBardeleben Coal Co.	Birmingham	Corona
		Coal Valley
		Empire
		Hulls
		Payne Bend
		Sipsey
		Townley
Deepwater Black Creek Coal Co.	Jasper	Nauvoo
Dixie Coal Mining Co.	Jasper	Wabash
Doliska Coal Co.	Dora	Doliska
J. O. Drewery Contracting Co.	Birmingham	Sunlight
Galloway Coal Co.	Memphis, Tenn.	Carbon Hill
M. H. Gossett	Jasper	Sunlight
T. S. Hendon	Townley	Supreme
Hilliard Coal Mining Co.	Jasper	Hillard
George B. Hooper	Tuscaloosa	
Indian Head Mills of Alabama	Cordova	Indian Head
Kershaw Mining Co.	Birmingham	Cedron
Louise Coal Co	Cordova	Louise
Manchester Coal Co.	Manchester	Manchester
Mill Creek Coal Co.	Carbon Hill	Mill Creek
Moore and Mankin	Jasper	Manchester
Oakman Mining Co.	Oakman	Oakman
Guy V. and Cain O'Rear	Carbon Hill	America
		Hynd
Parrish Coal Co.	Parrish	Drifton
		Blanton
		Gayosa
		Rainbow
Phillips Coal Co.	Jasper	Phillips
Piedmont Coal Co.	Dora	Piedmont
Pratt Fuel Corporation	Birmingham	Clipper
		Dora
		Jaggers
		Magella
		Pratt
		Red Star
		Sumoset
		Yerkwood
Railway Fuel Corporation	Birmingham	Parrish
River Pratt Coal Co.	Oakman	King
Rogers Mining and Construction Co.	Jasper	Davis
Sargossa Mining Co.	Sargossa	Sargossa
		Mary Lee
Sartin-Boyer Coal Co.	Good Springs	Boyer
		Sartin
Z. B. Shepherd	Carbon Hill	Self
Sherman Coal Co.	Fayette	Atlas
Sipsey Coal Mining Co.	Empire	Dilworth
Sloss-Sheffield Steel and Iron Co.	Birmingham	Ivy
Southeastern Fuel Co.	Birmingham	Drifton
Stephenson Brick Co.	Birmingham	Stephenson
Stith Coal Co.	America	Aldridge
		Bon Aire

Operator	*Address*	*Mine*
Thomas Creek Coal Co.	Carbon Hill	Bynon
Townley Coal Co.	Townley	Lang
Victory Coal Co.	Carbon Hill	Carbon Hill
Warner Coal Co.	Cordova	Charlotte
T. R. Childers and Sons	Jasper	Childers
W. A. Cook	Parrish	Cook
Ellis Taylor Coal Co.	Jasper	Ellis
Lone Star Cement Co.	Birmingham	Ivy Bluff
G. H. Myers	Jasper	Myers
R. B. Williams	Carbon Hill	Williams

Winston County

Beulah Coal Mining Co.	Natural Bridge	Beulah
T. P. Weaver	Delmar	Weaver
Winston Coal Co.	Glen Mary	Glen Mary
J. M. Hix	Haleyville	Hicks Strip
J. E. West	Delmar	West

COKE

INTRODUCTION

The term *coke* as used in this chapter does not include breeze or fine screenings, however, the dividing line has not been definitely fixed and varies with the different operators. The greater part of the coke produced is consumed in the metallurgical industries, and since petroleum coke and gas-house coke are not adapted to this use, they are not included in the following statistics. These cokes are used primarily for local heating purposes either in the raw state or in the form of briquets. Thus the coke trade is concerned primarily with metallurgical coke which is produced in the by-product ovens and beehive ovens.

Due to the permanently higher prices for coke and the steadily expanding markets for the by-products, the modern by-product ovens have practically replaced the beehive type. The beehive coke industry has steadily assumed the character of a reserve agency, which is called upon to supply the peak requirements of the metallurgical industries in times of active business.

SUMMARY OF PRODUCTION

There were 1,388 by-product coke ovens in operation in Alabama in 1928 with a combined output of 4,327,324 tons of coke, valued at $13,260,-178, as compared with an output of 4,364,354 tons, valued at $13,500,230 in 1927. Of this number of ovens, 908 were of the Koppers type; 420 were of the Semet-Solvay type; and 60 were of the Wilputtte type. In the manufacture of this coke, 6,215,804 tons of coal were used, which represents an average yield of 0.695 ton of coke per ton of coal. The average value of the coke at the plants was $3.06 per ton, as compared with $3.09 per ton in 1927.

It is interesting to note that 937 or 67 per cent of all the by-product coke ovens in Alabama in 1928 were operated in connection with iron and steel furnaces.

No production of beehive coke was reported in 1928. These ovens, as a general rule, are not operated continuously, but are called upon only to supply the peak demands for coke of the metallurgical industries in times of active business.

A large part of the coke manufactured in Alabama is consumed in the iron and steel industries of the Birmingham district, although there is a growing demand for coke as a domestic fuel.

The production of metallurgical coke in the United States in 1928 amounted to 52,805,828 tons, valued at $252,833,760, as compared with 51,092,143 tons, valued at $262,320,578 in 1927. Of the total output, 91.49 per cent was produced in by-product ovens and 8.51 per cent in bee-hive ovens. There were 85 by-product plants in the United States that produced coke in 1928; 46 were operated in connection with iron furnaces; and 39 were non-furnace plants. The furnace plants were responsible for 79.2 per cent of the total output, and the non-furnace plants produced 20.8.

The average yield of coke and by-products per net ton of coal charged is given below:

Average yield of coke and by-products per net ton of coal charged in by-product ovens in the United States, 1915-1928

Product	*Unit*	1915	1923	1924	1925	1926	1927	1928
Coke	Pounds	1,440	1,386	1,386	1,398	1,394	1,388	1,378
Tar	Gallons	7.1	8.1	8.6	8.4	8.3	8.6	9.0
Ammonium sulphate (or equivalent)	Pounds	20.1	21.2	22.2	22.4	21.7	22.7	22.0
Light oil	Gallons	1.5	*2.7	*2.9	*2.9	*2.8	*2.9	*3.0
Gas:								
Total	M. cubic feet	11.0	11.1	11.0	11.2	11.1	11.1	11.1
Surplus sold or used	M. cubic feet	4.3	5.9	6.1	6.3	6.2	6.5	6.5
Burned in coking process	M. cubic feet	6.3	5.0	4.7	4.7	4.7	4.4	4.3
Wasted	M. cubic feet	.4	.2	.2	.2	.2	.2	.3

*—Average for plants now recovering light oil.

The following tables give detailed statistics of the production and uses of coke in the United States for 1928, by states:

By-product and beehive coke produced in the United States, 1928

State	By-Product					Beehive				Total	
	Ovens Built	*Ovens Building*	*Coal Used (Net Tons)*	*Coke Produced (Net Tons)*	*Value of Coke at Ovens*	*Ovens Built*	*Coal Used (Net Tons)*	*Coke Produced (Net Tons)*	*Value of Coke at Ovens*	*Coke Produced (Net Tons)*	*Value of Coke at Ovens*
Alabama	1,388		6,215,804	4,327,324	$13,260,178	953				4,327,324	$13,260,178
Colorado	120		891,315	605,822	†	1,498	220,515	144,200	†	750,022	†
Connecticut	61		*	*	*					*	*
Georgia							*	*	*	*	*
Illinois	937	21	4,712,289	3,240,964	19,967,463					3,240,964	19,967,463
Indiana	1,384		8,202,943	6,094,201	38,237,790					6,094,201	38,237,790
Maryland	108		*	*	*	608	*	*	*	*	*
Kentucky	360		1,635,668	1,186,398	†					1,186,398	†
Massachusetts	381		1,035,336	687,356	5,269,890					687,356	5,269,890
Minnesota	576		3,397,164	2,399,656	13,461,466					2,399,656	13,461,466
Michigan	196		899,938	622,696	5,816,566					622,696	5,816,566
New Jersey	64		*	*	*					*	*
Missouri	207		1,252,990	903,177	†					903,177	†
New Mexico						584					
New York	868		5,501,162	3,802,657	25,033,649					3,802,657	25,033,649
Ohio	1,820	15	11,466,044	7,786,199	33,908,863	202	*	*	*	*	*
Oklahoma						100					
Pennsylvania	3,235	109	20,325,663	13,475,349	51,132,406	27,552	5,266,357	3,442,006	$11,515,366	16,917,355	62,647,772
Rhode Island	40		*	*	*					*	*
Tennessee	24		151,424	113,134	606,398	1,415	173,706	103,791	457,489	216,925	1,063,887
Utah	56		448,350	246,503	†	819	48,675	28,097	†	274,600	†
Virginia						2,914	420,765	247,734	1,052,016	247,734	1,052,016
Washington	20		64,458	40,755	285,285	235	29,353	18,747	151,902	59,502	437,187
West Virginia	411		1,966,364	1,367,481	3,761,460	4,408	733,504	431,419	1,543,933	1,798,900	5,305,393
Wisconsin	288		*	*	*					*	*
Combined States			1,998,994	1,413,353	9,682,047		125,099	76,809	406,691	9,276,361	43,997,601
Undistributed					16,091,743				1,191,159		17,282,902
	12,544	145	70,165,906	48,313,025	236,515,204	41,288	7,017,974	4,492,803	16,318,556	52,805,828	252,833,760

†—Included under "Undistributed."
*—Included under "Combined States."

By-product coke produced, used by the producer, and sold, 1928
(Exclusive of screenings and breeze)

State	Produced		Used by Producer in Blast Furnaces, Etc.	
	Net Tons	Value	Net Tons	Value
Alabama	4,437,324	$13,260,178	3,412,132	$ 9,719,349
Colorado	605,822	*	607,132	*
Illinois	3,240,964	19,967,463	1,888,276	11,341,743
Indiana	6,094,201	38,237,790	5,397,797	33,983,913
Maryland	1,186,398	*	1,090,870	*
Massachusetts	687,356	5,269,890	15,127	95,857
Michigan	2,399,656	13,461,466	495,668	1,861,898
Minnesota	622,696	5,816,566	292,757	2,583,671
New Jersey	903,177	*	90,230	*
New York	3,802,657	25,033,649	1,350,074	8,972,393
Ohio	7,786,199	33,908,863	6,222,552	26,785,216
Pennsylvania	13,475,349	51,132,406	11,697,932	43,674,050
Tennessee	113,134	606,398	----------	----------
Utah	246,503	*	161,741	*
Washington	40,755	285,285	38,352	268,457
West Virginia	1,367,481	3,761,460	1,147,803	2,916,400
Conn., Ky., Mo., R. I., and Wisc.	1,413,353	9,682,047	30,472	209,380
Undistributed	----------	16,091,743	----------	8,544,301
	48,313,025	236,515,204	†33,938,915	†150956628

State	Sold for Furnace Use‡		Sold for Foundry Use	
	Net Tons	Value	Net Tons	Value
Alabama	*	*	411,670	$ 1,855,772
Illinois	274,278	$ 1,564,589	*	*
Indiana	----------	----------	275,249	2,080,573
Massachusetts	*	*	*	*
Michigan	*	*	80,390	684,412
Minnesota	*	*	----------	----------
New Jersey	----------	----------	77,197	*
New York	1,102,526	6,430,579	*	*
Ohio	860,114	4,142,169	184,077	1,227,038
Pennsylvania	1,597,670	6,538,630	*	*
Tennessee	42,951	193,280	23,722	118,610
Utah	81,231	*	3,232	*
West Virginia	*	*	*	*
Conn., Ky., Mo., R. I., and Wisc.	205,467	990,089	368,046	2,850,590
Undistributed	624,841	4,042,917	531,711	4,828,412
	4,789,078	23,902,253	1,955,294	13,645,407

	Sold for Domestic Use*		Sold for Industrial and Other Use		Total Sales	
	Net Tons	Value	Net Tons	Value	Net Tons	Value
Alabama	352,470	$ 1,170,007	*	*	800,605	$ 3,202,266
Colorado	68	*	10,301	*	10,369	*
Illinois	739,408	4,845,910	*	*	1,285,638	8,338,089
Indiana	420,535	2,061,630	26,812	$ 167,854	722,596	4,310,057
Maryland	1,900	*	86,368	*	88,268	*
Massachusetts	247,128	2,036,225	91,071	*	684,635	5,239,112
Michigan	1,530,400	9,375,730	*	*	1,971,446	11,980,239
Minnesota	*	*	*	*	271,620	2,639,660
New Jersey	370,959	*	349,950	*	798,106	*
New York	995,706	7,096,769	*	*	2,454,305	16,124,983
Ohio	520,695	1,983,018	88,870	384,006	1,653,756	7,736,231
Pennsylvania	81,537	371,827	*	*	1,778,092	7,438,357
Tennessee	26,233	186,515	------------	------------	92,906	498,405
Utah	------------	------------	------------	------------	84,463	*
Washington	4,623	32,361	------------	------------	4,623	32,361
West Virginia	*	*	*	*	233,986	*
Conn., Ky., Mo., R. I. and Wisc.	661,227	4,381,189	147,229	1,092,136	1,381,969	9,314,004
Undistributed	301,493	5,418,634	518,028	7,034,858	------------	8,332,565
	6,254,382	38,959,815	1,318,629	8,678,854	14,317,383	85,186,329

*—Included under "Undistributed."

†—Includes 988,086 tons, valued at $5,652,384 used in affiliated works, not blast furnaces.

‡—Includes 3,136,547 tons, valued at $15,007,542, sold to affiliated corporations, and 1,652,531 tons, valued at $8,894,711, reported as merchant sales.

ALABAMA PRODUCERS OF BY-PRODUCT COKE

Gulf States Steel Co., Birmingham. Works at Alabama City, Etowah County.

Alabama By-Products Corporation, Birmingham. Works at Tarrant, Jefferson County.

Republic Iron and Steel Co., Youngstown, Ohio. Works at Thomas, Jefferson County.

Semet-Solvay Co., Syracuse, N. Y. Works at Ensley, Jefferson County.

Sloss-Sheffield Steel and Iron Co., Birmingham. Works at North Birmingham, Jefferson County.

Tennessee Coal, Iron and Railroad Co., Birmingham. Works at Fairfield, Jefferson County.

Woodward Iron Co., Birmingham. Works at Woodward, Jefferson County

Central Iron and Coal Co., Holt. Works at Holt, Tuscaloosa County.

GRAPHITE

SUMMARY OF PRODUCTION

There were three producers of graphite in Alabama in 1928 with a combined output of 1,575,500 pounds, valued at $81,750, as compared with 3,474,000 pounds, valued at $146,730 in 1927. The entire output was of the crystalline variety from Chilton, Clay and Coosa counties. The average value of the product was 5.13 cents per pound. Alabama dropped to second place among the states producing crystalline graphite in 1928, which were in order of importance Texas, Alabama, New Jersey and Georgia.

The graphite industry of the United States as a whole was more active in 1928 than in 1927. The quantity of natural graphite sold or used by producers in 1928 amounted to 5,611 tons, valued at $297,093, an increase of 8 per cent in quantity and 2.8 per cent in value, as compared with 1927. The increase in qualtity was chiefly in the amorphous variety, while the crystalline graphite showed only a slight gain. The total output consisted of 2,994 tons of amorphous and 2,617 tons of crystalline graphite, an increase of 15 per cent in amorphous but only 0.2 per cent in crystalline. The value of the amorphous graphite produced in 1928 was $43,320, an increase of 21 per cent over 1927, and the value of crystalline graphite was $253,773, an increase of 29 per cent. The quantity and value of crystalline graphite in 1928 was the largest for any year since 1920.

Three states reported production of amorphous graphite in 1928, in order of importance Rhode Island, Michigan and Nevada.

VALUE

The value of domestic crystalline graphite at the mines in 1928 ranged from 1.5 to 5.8 cents per pound compared with 2.5 to 7 cents in 1927. The general average value was 4.8 cents per pound in 1928 as against 3.8 cents per pound in 1927. It is interesting to compare this value with that of the Alabama product—5.18 cents per pound. The average price of Ceylon graphite c. i. f. New York in 1928 is given below in cents per pound: First grade lump, 7.5 to 9.5; second grade lump, 6.5 to 8.5; first grade chip, 6.5 to 7.5; second grade chip, 5.5 to 6.5; first grade dust, 3.5 to 5.5; and second grade dust, 3 to 4.5.

IMPORTS

The graphite imported into the United States in 1928 amounted to 17,569 tons, valued at $801,559, an increase of less than one per cent in quantity but eleven per cent in value over 1927. The increase was due entirely to the increase of 25 per cent in quantity and 20 per cent in value of the crystalline graphite imported, as imports of amorphous decreased 19 per cent in quantity and 27 per cent in value. The value of the crystalline graphite imported was 87 per cent of the total for 1928.

ALABAMA PRODUCERS

The Alabama Machinery and Supply Co., Montgomery. Mine at Mountain Creek, Chilton County.

Superior Flake Graphite Co., Chicago, Ill. Mine at Ashland, Clay County.

The Southwestern Consolidated Graphite Co., Boston, Mass. Mine at Hollins, Coosa County.

IRON ORE, PIG IRON AND STEEL

INTRODUCTION

The iron ore produced in Alabama is of two varieties—hematite and brown ore. Practically all the hematite is mined in Jefferson County chiefly along Red Mountain between Birmingham and Bessemer, although there is a small production from the Gadsden district in Etowah County. The brown ore is more widely distributed, and in 1928, six counties, Tuscaloosa, Blount, Franklin, Talladega, Calhoun and Cherokee, contributed to the output. The hematite normally amounts to about 90 per cent of all the iron ore mined in the state.

SUMMARY OF PRODUCTION

The production of iron ore in Alabama in 1928 amounted to 6,307,844 long tons as compared with 6,445,464 long tons in 1927, a decrease of two per cent. These figures do not include a small amount of red ore from Etowah County used for paint pigment. This output was made by 24 mines located in eight counties as shown by the following table:

Iron ore mined in Alabama, 1927 and 1928, by counties

County	1927		1928	
	Active Mines	*Gross Tons*	*Active Mines*	*Gross Tons*
Blount	5	197,446	5	247,255
Etowah	1	1,978	1	10,472
Franklin	1	128,088	1	104,858
Jefferson	7	5,857,326	6	5,658,021
Tuscaloosa	5	240,041	5	261,918
Calhoun	1	20,585	2	25,320
Cherokee	1		3	
Talladega	2		1	
	23	6,445,464	24	6,307,844

The iron ore produced in Blount County was brown ore, all of which was washed; the iron content of the concentrates averaged 50 per cent, the manganese averaged 0.75 per cent, and the phosphorus averaged 0.3 per cent. The ore produced in Talladega County was also brown ore,

averaging about 53 per cent iron. The brown ore concentrates from the Russellville district, Franklin County, averaged 49 per cent iron. Tuscaloosa County was the largest producer of brown ore in the state in 1928; the iron content of the concentrates ranged from 44.49 to 47.42 per cent and averaged 45.62 per cent.

Most of the iron ore mined in Alabama is hematite or red ore, much of which is self fluxing or nearly so. Jefferson County is by far the leading producer; the iron content of the ore shipped from the mines in this county in 1928 ranged from 32.98 to 37.18 per cent, natural, and average 36.56 per cent.

The Birmingham district in 1928 shipped a little less than 10 per cent of the iron ore produced in the United States, and ranked second to the Lake Superior district which supplied a little more than 84 per cent of the total.

The iron ore shipped from the mines in Alabama in 1928 amounted to 6,159,863 long tons, valued at $11,599,176 as compared with 6,508,419 long tons, valued at $12,973,597 in 1927. There were six mines in operation in 1928 with outputs in excess of 100,000 tons each, and two of these produced more than 1,000,000 tons each. The following table gives the names of these mines together with the location, output and rank in the United States:

Iron-ore mines of Alabama that produced more than 100,000 *gross tons each in* 1928

Rank	*Name of Mine*	*Nearest Town*	*Variety of Ore*	*Gross Tons*
2	Red Mountain group	Bessemer	Hematite	3,334,036
8	Woodward, Nos. 1, 2, and 3	Bessemer	Hematite	1,112,630
18	Sloss, Nos. 1 and 2	Bessemer	Hematite	637,243
43	Raimund Nos. 1 and 2	Bessemer	Hematite	405,003
102	Shannon	Birmingham	Hematite	155,203
121	Russellville	Russellville	Brown ore	104,858

The iron ore produced in the United States in 1928 amounted to 62,197,088 long tons as compared with 61,741,100 long tons in 1927. This tonnage was mined in 17 states; the rank of the three states producing the largest quantity of ore, Minnesota, Michigan and Alabama, remained unchanged.

The following table gives detailed statistics of the iron ore mined in the United States in 1928, by states:

Iron ore mined in the United States, 1927 *and* 1928, *by States and varieties, in gross tons*

Exclusive of ore containing 5 per cent or more of manganese.)

State	*Number of Active mines*	*Hematite*	*Brown Ore*	*Magnetite*	*Carbonate*	*Total*
Alabama	24	5,668,493	639,351	-----	-----	6,307,844
Colorado	1	-----	52,713	-----	-----	52,713
Georgia	4	-----	73,052	-----	-----	73,052
Michigan	64	13,676,984	-----	-----	-----	13,676,984
Minnesota	84	37,564,005	-----	-----	-----	37,564,005
Missouri	2	94,899	-----	-----	-----	94,899
Montana	3	-----	1,640	-----	-----	1,640
New Jersey	3	-----	-----	250,332	-----	250,322
New Mexico	1	-----	-----	184,623	-----	184,623
New York	5	*	-----	*712,757	-----	712,757
North Carolina	3	-----	-----	1,022,080	1,790	1,023,870
Pennsylvania	6	83,662	45,266	-----	-----	128,928
Tennessee	1	320,655	-----	-----	-----	320,655
Utah	2	23,287	4,615	-----	-----	27,902
Virginia	1	-----	-----	1,012	-----	1,012
Washington	6	1,284,592	-----	-----	-----	1,284,592
Wisconsin	1	491,280	-----	-----	-----	491,280
Wyoming						
	211	*59,207,857	816,637	*2,170,804	1,790	62,197,088

*—Some hematite included with magnetite.

VALUE

The average value of the hematite produced in Alabama in 1928 was $1.82 per ton as compared with $1.98 in 1927, while the average value of the brown ore was $2.38 per ton, as compared with $2.58 per ton in 1927. The average value of the hematite produced in the United States in 1928 was $2.34 per ton, and the average value of the brown ore for the same year was $2.27 per ton. All of the values given above are *at the mine* and do not include freight charges.

BLAST FURNACE CONSUMPTION

It is interesting to note that the furnaces operating in Alabama in 1928 consumed on an average of 2,461 tons of ore for each ton of pig iron produced, the highest average for any state. The greater part of the ore used by these furnaces was hematite from Jefferson County; a small quantity of hematite from Etowah County was also used. The brown ore used was obtained chiefly from mines in the Birmingham and Russellville districts, and from the Cedartown district, Georgia. The manganiferous

iron ore was chiefly from mines in Alabama, Arkansas, Georgia and Virginia.

The following table gives the consumption of iron ore and other metallic materials, and the pig iron produced in 1928, by states:

Iron ore and other metallic materials consumed and pig iron produced in 1928, by States, in gross tons

State	Metalliferous Materials Consumed				Pig Iron Produced, Exclusive of Ferro-Alloys	Materials Consumed per Ton of Iron Made		
	Iron and Manganiferous Iron Ores		Cinder, Scale, and Scrap	Total		Ores	Cinder, Scale, and Scrap	Total
	Domestic	Foreign						
Alabama	6,123,553	70,997	182,516	6,377,066	2,517,485	2.461	0.072	2.533
Illinois	7,211,856	—	516,111	7,727,967	3,943,558	1.829	.131	1.960
Indiana	7,018,416	—	550,208	7,568,624	3,838,626	1.829	.143	1.972
Kentucky	303,719	—	101,748	405,467	225,545	1.347	.451	1.798
Maryland	—	1,381,163	241,856	1,623,019	968,277	1.426	.250	1.676
Michigan	1,222,721	—	98,298	1,321,019	744,439	1.643	.132	1.775
Minnesota	529,470	—	85,092	614,562	332,215	1.594	.256	1.850
New York	4,129,677	—	188,790	4,318,467	2,198,380	1.878	.086	1.964
Ohio	15,330,463	—	1,642,031	16,972,494	9,020,969	1.699	.182	1.881
Pennsylvania	19,135,384	1,031,976	2,263,819	22,431,179	12,054,976	1.673	.188	1.861
Tennessee	184,145	—	12,626	196,771	91,431	2.014	.138	2.152
Utah	327,344	—	—	327,344	165,702	1.975	—	1.975
Virginia	61,030	—	51,351	112,381	57,254	1.066	.897	1.963
West Virginia	1,163,170	—	33,041	1,196,211	642,161	1.811	.052	1.863
Undistributed*	1,054,607	141,484	59,298	1,255,389	609,879	1.961	.097	2.058
	63,795,555	2,625,620	6,026,785	72,447,960	37,410,897	1.776	.161	1.937

*—Includes Colorado, Massachusetts, and Wisconsin.

BENEFICIATED ORE

The beneficated ore shipped from mines in Alabama in 1928 amounted to 649,645 long tons, valued at $1,546,671 as compared with 607,681 long tons, valued at $1,567,178 in 1927, an increase of 6.9 per cent in quantity, but a decrease of 1.3 per cent in value.

IMPORTS AND EXPORTS

The iron ore imported into the United States in 1928 amounted to 2,452,646 long tons, valued at $5,428,019, or $2.21 per ton, as compared with 2,620,717 long tons, valued at $6,068,283, or $2.32 per ton in 1927. Africa, Chile and Cuba together furnished 92 per cent of the total tonnage imported.

Exports of iron ore from the United States in 1928 amounted to 1,282,306 long tons, valued at $4,797,881, or $3.74 a ton, as compared with 898,793 long tons, valued at $3.81 a ton in 1927. More than 97 per cent of the iron ore exported in 1928 went to Canada; the remainder went to the United Kingdom.

PIG IRON

The pig iron manufactured in Alabama in 1928 amounted to 2,546,009 long tons, as compared with 2,782,993 long tons in 1927, a decrease of 8.2 per cent. There were 19 furnaces in blast on December 31, 1928, as compared with 18 on the corresponding day in 1927. There were 32 blast furnaces in operating condition in Alabama on December 31, 1928; three had been dismantled during the year.

The shipments of pig iron from the furnaces in Alabama in 1928 amounted to 2,525,812 long tons, valued at $42,197,935, a decrease from 1927 of 6.63 per cent in amount and 15.93 per cent in value. The average value of this iron at the furnaces was $16.71 a ton, as compared with an average price of $18.55 per ton in 1927.

The pig iron manufactured in the United States in 1928 amounted to 38,155,714 long tons, as compared with 36,565,645 long tons in 1927. The average value of the pig iron shipped from the furnaces in the United States was $17.27 a ton, or $1.26 a ton less than in the previous year.

The following table gives the production of pig iron in the United States in 1927 and 1928, by states:

Pig iron (including ferro-alloys) manufactured in the United States, 1927 *and* 1928, *in gross tons**

State	1927	1928	*State*	1927	1928
Pennsylvania	11,829,599	12,422,602	West Virginia	699,514	864,922
Ohio	8,502,459	9,098,739	Kentucky		
Illinois	3,588,595	3,942,412	Iowa		
Alabama	2,782,993	2,546,009	Colorado	641,057	634,270
Indiana	4,201,802	4,583,065	Utah		
Michigan			Maryland	855,566	1,050,876
New York	2,775,351	2,562,715	Virginia	99,197	
Massachusetts			Tennessee	133,785	110,837
Wisconsin	455,727	339,267			
Minnesota					
				36,565,645	38,155,714

*—American Iron and Steel Institute.

STEEL

The production of steel in Alabama in 1928 is not available, but it may be stated that the production is small as compared to the United States as a whole. The more important producers are in order of importance, Pennsylvania, Ohio, Indiana, Illinois, New York and New Jersey.

The iron ores of Alabama contain relatively high percentages of phosphorus—well above the Bessemer limit—so that the steel is produced by the Duplex process, a combination of the acid Bessemer and basic open-hearth processes.

The production of steel in the United States in 1928 amounted to 51,544,180 long tons, of which 44,113,956 long tons were made in the open-hearth furnaces; 6,621,195 tons were made in Bessemer conventers; 7,769 tons were made by the crucible process; and the remaining 802,260 tons were produced by other methods.

ALABAMA PRODUCERS

HEMATITE OR RED ORE

Operator	*Address*	*Mine*
Etowah County		
Jirami Ore Co.	Birmingham	Tumlin Gap
Jefferson County		
Central Iron and Coal Co.	Holt	Valley View
Gulf States Steel Co.	Birmingham	Sloss
		Irondale
Republic Iron and Steel Co.	Youngstown, Ohio	Raimund
Sloss-Sheffield Steel and Iron Co.	Birmingham	Sloss
		Irondale
Tennessee Coal, Iron and Railroad Co.	Birmingham	Red Mountain
		Fossil
		Ishkoda
		Muscoda

LIMESTONE OR BROWN ORE

Operator	*Address*	*Mine*
Blount County		
Shook and Fletcher Supply Co.	Birmingham	Taits Gap
		Champion
Calhoun County		
C. E. Page	Gadsden	Stephens
		Janney

Operator	*Address*	*Mine*
	Cherokee County	
C. E. Page	Gadsden	Bluffton
Rock Run Iron Co.	Rock Run	Weems
Woodward Iron Co.	Birmingham	Tecumseh
	Franklin County	
Sloss-Sheffield Steel and Iron Co.	Birmingham	Russellville
	Talladega County	
Rendalia Mines, Inc.	Rendalia	Clournoy
	Tuscaloosa County	
Central Iron and Coal Co.	Holt	Giles
Republic Iron and Steel Co.	Birmingham	Tannehill
		Houston
Tennessee Coal, Iron and Railroad Co.	Birmingham	Greeley
Woodward Iron Co.	Birmingham	Docray

PIG IRON

Central Iron and Coal Co., Holt, Tuscaloosa County.

Gulf States Steel Co., Alabama City, Etowah County.

Republic Iron and Steel Co., Thomas, Jefferson County.

Sloss-Sheffield Steel and Iron Co., Birmingham, Jefferson County.

Tennessee Coal, Iron and Railroad Co., Ensley, Jefferson County.

Woodward Iron Co., Woodward, Jefferson County.

STEEL

Gulf States Steel Co., Alabama City, Etowah County.

Tennessee Coal, Iron and Railroad Co., Ensley, Jefferson County.

LIME

SUMMARY OF PRODUCTION

The lime produced in Alabama in 1928 amounted to 192,364 tons, valued at $1,407,232, as compared with 206,010 tons, valued at $1,566,287 in 1927, a decrease of 6.62 per cent in amount and 10.4 per cent in value. Eleven plants operating in four counties were responsible for the entire output. Jefferson County was by far the leading producer of lime in Alabama in 1928; practically the entire tonnage was metallurgical lime, used locally for steel-furnace flux, for coating pig-iron molds, and in the recovery of ammonia from by-product coke ovens. A small amount of the output was of chemical grade used for purfying water. Shelby County was the leading producer of high-grade lime, the greater part of which was building lime, although there was a smaller production of chemical and agricultural grades. The chemical lime was used in refining sugar, in the manufacture and dehydration of alcohol, in the manufacture of paper, and in the purification of water.

The other counties producing lime in 1928 were Blount and Colbert. The average value at the plant of the lime sold by producers in Alabama in 1928 was $7.31 a ton, or 29 cents a ton less than in 1927.

The lime sold by producers in the United States in 1928 amounted to 4,458,412 tons, valued at $36,449,635, an increase of one per cent in quantity, but a decrease of six per cent in value, as compared with 1927. This tonnage was produced by 411 plants, six less than in 1927. The average value at the plant of all the lime sold by producers in 1928 was $8.18 a ton as compared with $8.75 a ton in 1927, a decrease of 6.5 per cent.

The following table gives detailed statistics of the lime sold by producers in the United States in 1928 by states and uses:

Lime sold by producers in the United States in 1928, by States and uses

State	Building		Agricultural		Chemical												Total	
					Glass Works		Paper Mills		Sugar Refineries		Tanneries		Metallurgy		Other Chemical			
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Alabama	59,194	$ 436,359	*	*			22,588	$ 144,768	*	*			*	*	39,938	$ 300,734	192,364	$1,407,232
Arizona	12,759	156,375	133	$ 2,128	359	$ 5,744					60	$708	19,765	$ 129,481	3,168	48,731	36,244	343,167
Arkansas	14,426	141,442	*	*			23,470	172,504							*	*	40,438	339,624
California	42,256	424,559	1,851	11,023			*	*			*	*	5,425	57,369	9,704	108,557	60,751	617,472
Colorado	3,286	36,385											3,265	35,255	1,563	17,135	8,114	88,775
Connecticut	44,166	498,198	2,006	13,918			1,980	17,820									48,152	529,936
Florida	4,748	50,086															4,748	50,086
Georgia	12,548	80,991	342	2,054													12,890	83,045
Hawaii	347	5,852	654	2,844					5,283	$63,396							6,284	72,092
Idaho	*	*	*	*			*	*									*	*
Illinois	65,701	613,595					10,884	84,683			6,645	60,284	4,734	34,337	27,559	224,102	115,523	1,017,001
Indiana	11,542	90,589	12,257	35,905	*	*	25,300	165,345			*	*	11,760	72,801	41,664	333,009	107,209	734,915
Iowa	*	*															*	*
Kentucky	*	*	*	*							*	*	*	*	*	*	*	*
Maine	66,490	629,748	13,399	60,131			*	*			*	*	*	*	*	*	123,023	1,056,443
Maryland	*	*	45,745	368,608									*	*			59,508	440,886
Massachusetts	126,232	1,655,582	3,668	18,166			15,539	126,248	405	7,944	1,659	17,656	330	2,970	24,111	197,453	171,944	2,026,019
Michigan	7,339	66,932	*	*			84,000	773,517			*	*			11,307	107,704	104,917	962,708
Minnesota	*	*					*	*					*	*	*	*	*	*
Missouri	94,025	805,061	1,780	11,327	*	*	13,399	82,150			*	*	35,084	202,834	155,243	1,123,746	303,014	2,252,420
Montana	*	*											*	*	*	*	*	*
Nevada	*	*					*	*	*	*			*	*	*	*	*	*
New Jersey			*	*													*	*

Lime sold by producers in the United States in 1928, by States and uses—Continued

State	Building		Agricultural		Chemical												Total	
					Glass Works		Paper Mills		Sugar Refineries		Tanneries		Metallurgy		Other Chemical			
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
New Mexico	862	8,835	—	—	—	—	—	—	—	—	—	—	—	—	1,140	10,830	2,002	19,665
New York	26,904	194,777	3,009	22,202	92	866	14,419	130,185	105	857	5,166	49,982	14,370	126,740	29,289	268,692	93,354	794,301
North Carolina	*	*	—	—	—	—	—	—	—	—	*	*	—	—	—	—	*	*
Ohio	657,865	5,612,487	29,357	187,419	69,384	529,870	35,151	249,800	—	—	*	*	*	*	199,622	2,175,698	1,013,676	8,919,596
Oregon	1,890	31,572	—	—	—	—	—	—	—	—	—	—	—	—	200	2,800	2,090	34,372
Pennsylvania	251,056	1,964,044	154,177	1,133,190	*	*	47,686	329,118	*	*	20,912	157,330	117,961	665,415	239,770	1,851,210	834,050	6,119,036
Porto Rico	246	2,557	292	2,740	—	—	—	—	8,716	138,917	—	—	—	—	151	2,826	9,405	147,040
Rhode Island	1,862	29,922	669	6,021	—	—	—	—	—	—	—	—	—	—	58	932	2,589	36,875
South Dakota	*	*	*	*	—	—	—	—	—	—	—	—	*	*	*	*	*	*
Tennessee	77,701	675,824	1,441	7,706	—	—	43,246	223,368	2,940	26,030	4,173	21,458	14,908	68,873	39,132	215,686	183,541	1,238,945
Texas	50,944	482,195	*	*	*	*	*	*	*	*	—	—	*	*	18,464	172,789	82,325	751,729
Utah	8,801	131,791	*	*	—	—	—	—	*	*	—	—	38,022	241,960	*	*	47,662	385,476
Vermont	27,234	278,965	3,794	15,004	—	—	8,501	71,028	—	—	2,868	29,229	4,352	37,886	5,696	53,123	52,445	485,235
Virginia	69,825	536,468	38,493	244,584	—	—	15,261	99,387	720	4,860	8,693	54,084	977	5,265	40,098	263,970	174,067	1,208,618
Washington	15,217	167,012	*	*	—	—	3,513	37,569	*	*	—	—	*	*	*	*	24,529	265,922
West Virginia	28,450	204,565	17,201	115,281	*	*	*	*	*	*	*	*	*	*	134,043	1,048,569	279,947	1,788,989
Wisconsin	153,389	1,228,128	*	*	—	—	7,691	66,081	—	—	*	*	—	—	*	*	163,965	1,374,749
Undistributed	49,160	465,524	3,642	27,307	6,326	51,825	56,706	487,162	4,509	38,182	14,288	104,252	233,295	1,373,895	19,232	248,073	97,642	857,266
	1,986,465	17,706,420	333,910	2,287,558	76,161	588,305	429,334	3,260,733	22,678	280,186	64,464	494,983	504,248	3,055,081	1,041,152	8,776,369	4,458,412	36,449,635

*—Included under "Undistributed."

HYDRATED LIME

The hydrated lime sold by producers in Alabama in 1928 amounted to 34,376 tons, valued at $269,729, as compared with 31,055 tons, valued at $232,466 in 1927, an increase of 10.69 per cent in amount and 16.03 per cent in value. The increase in the sales of hydrated lime in view of a decline in total sales indicates that there is a steadily increasing market for the hydrated product.

ALABAMA PRODUCERS

Operator	*Location of Kilns*
Blount County	
Cheney Lime Co.	Allgood
Colbert County	
Muscle Shoals White Lime Co.	Dennie
Jefferson County	
Tennessee Coal, Iron and Railroad Co.	Ensley
Shelby County	
Alabama Lime and Stone Corporation	Varnons
Calera Lime Works	Roberta
Cheney Lime Co.	Pelham
Keystone Lime Co.	Keystone
Longview Lime Co.	Longview
Newala Lime Works	Newala
Saginaw Lime and Stone Co.	Saginaw
Superior Lime and Hydrate Co.	Pelham

SAND AND GRAVEL

SUMMARY OF PRODUCTION

The sand and gravel sold or used by producers in Alabama in 1928 amounted to 3,315,985 tons, valued at $1,719,222, as compared with 2,085,696 tons, valued at $1,292,233 in 1927, an increase of 59 per cent in amount and 33 per cent in value. Of this output, 558,427 tons, valued at $178,255 were building sand; 528,827 tons, valued at $213,555 were paving and roadmaking sand; 686,554 tons, valued at $458,339 were building gravel; and 893,537 tons, valued at $655,640, were paving and roadmaking gravel. The remainder was sand and gravel for railroad ballast, engine sand and molding sand. The washed sand and gravel amounted to 2,660,057 tons, valued at $1,500,211, which was 80.2 per cent of the total quantity and 87.1 per cent of the total value.

The principal increase was in building sand and gravel, and paving and roadmaking sand and gravel. Twenty-six producers, operating in fifteen counties, were responsible for the entire output.

The sand and gravel sold or used by producers in the United States in 1928 amounted to 209,118,868 tons, valued at $119,207,937, an increase of six per cent in quantity and three per cent in value, as compared with 1927. Of this production, 97,737,717 tons, valued at $56,132,406 were sand, and 111,381,151 tons, valued at $63,075,531 were gravel.

The following table gives detailed statistics of the production of sand and gravel in the United States in 1928, by states and uses:

Sand and gravel sold or used by producers in the United States in 1928, by States and uses

State	Glass Sand		Molding Sand		Building Sand		Paving Sand		Grinding and Polishing Sand		Fire or Furnace Sand		Engine Sand	
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Alabama			*	*	558,427	$ 174,255	528,827	$ 213,555					*	*
Arizona					98,175	90,482	23,640	22,450					*	*
Arkansas	*	*	*	*	168,191	110,128	190,720	132,709	*	*	*	*	22,407	$ 11,781
California	*	*	67,904	$ 100,221	3,973,707	1,955,153	2,631,343	1,152,402	21,145	$ 42,701	22,794	$ 29,931	99,115	36,418
Colorado			*	*	234,212	184,521	71,477	45,785					27,364	19,650
Connecticut			438	1,186	403,585	275,278	147,992	86,951	*	*				
Delaware			7,960	4,984	15,607	12,211	27,800	15,619	936	2,340			7,000	2,400
Dist. of Columbia					318,696	175,283	216,065	118,836					5,402	2,971
Florida					328,256	154,228	296,613	135,400					*	*
Georgia			3,500	6,500	185,729	69,193	450,455	159,232	15,992	2,566			2,875	1,857
Hawaii							3,034	9,102						
Idaho			*	*	6,898	4,934	10,692	6,437					*	*
Illinois	658,036	$ 442,923	698,722	531,468	4,630,189	2,110,951	3,183,271	1,163,281	399,198	705,895	31,635	23,406	128,888	75,131
Indiana	*	*	361,740	202,052	1,928,655	708,998	1,931,304	913,609	*	*	73,380	29,350	103,220	37,265
Iowa			64,929	43,667	531,400	280,843	1,088,377	450,712	14,087	31,789			35,608	17,163
Kansas					1,346,266	783,002	469,556	242,951					60,121	30,973
Kentucky			12,684	22,595	583,588	568,660	279,434	164,088			*	*	51,974	32,579
Louisiana					306,291	166,221	207,391	78,351					*	*
Maine					47,150	48,150	42,872	27,306	*	*			*	*
Maryland	*	*	*	*	465,902	298,051	924,524	609,617	*	*			*	*
Massachusetts	436	2,451	35,950	39,591	1,347,309	1,005,498	178,557	93,642	5,226	8,433	*	*	38,162	32,996
Michigan	63,546	145,073	740,428	323,416	2,258,031	660,966	3,200,533	1,121,334	*	*	*	*	*	*
Minnesota			19,026	16,924	741,391	232,971	537,717	201,248	*	*			50,760	17,257
Mississippi					232,378	80,514	112,000	57,325					1,979	791
Missouri	145,554	188,960	95,503	64,814	1,223,547	722,807	743,642	490,130	*	*			65,010	47,271
Montana					29,347	18,925	20,618	19,270					1,994	218
Nebraska			1,000	2,000	545,350	254,506	119,993	63,103					29,688	10,229
Nevada	3,585	7,887	3,104	9,778			22,829	18,743						
New Hampshire							373,222	97,338					15,000	3,750
New Jersey	165,142	246,919	754,581	998,229	1,340,186	731,551	1,582,954	774,124	53,736	155,178	44,824	57,939	34,139	13,807
New Mexico					8,721	6,800	49,629	22,540	324	480			14,832	11,037
New York	*	*	550,993	824,429	8,962,122	4,169,686	4,545,193	2,479,199	*	*	*	*	142,531	84,395
North Carolina					329,412	75,330	127,431	29,985					53,186	28,110
North Dakota					34,439	27,776	3,725	2,525						
Ohio	63,422	118,570	782,676	1,094,370	3,009,969	1,810,198	2,455,827	1,459,541	*	*	81,160	154,586	66,762	50,562
Oklahoma	*	*			341,876	193,865	638,104	313,829	200	100			23,970	15,771
Oregon					476,737	324,094	188,600	121,158					15,437	6,700

*—Included under "Undistributed."

Sand and gravel sold or used by producers in the United States in 1928 by States and uses—Continued

State	Glass Sand		Molding Sand		Building Sand		Paving Sand		Fire or Furnace Sand		Grinding and Polishing Sand		Engine Sand	
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Pennsylvania	451,014	$ 906,350	379,493	$ 561,217	3,900,967	$3,106,845	2,610,945	$1,913,302	448,859	$ 509,047	40,809	$ 54,476	353,582	$ 382,499
Rhode Island			*	*	4,935	753	*	*						
South Carolina					59,353	26,672	*	*						
South Dakota					44,117	26,245	76,461	42,823					*	*
Tennessee			9,105	7,682	699,719	487,958	465,279	285,117	32,534	30,377			72,718	45,907
Texas			6,700	20,000	943,144	638,827	1,061,482	583,952	5,155	5,725			91,656	44,443
Utah					26,931	15,845	48,362	26,688					*	*
Vermont			2,236	559	1,620	600	16,053	10,059	86,800	31,000			*	*
Virginia	35,060	75,945	23,433	33,202	226,336	130,326	354,819	129,058	17,934	23,256	*	*	124,282	58,963
Washington			1,236	4,389	661,777	299,266	484,665	239,847					40,662	10,624
West Virginia	527,063	1,068,017	*	*	325,258	301,468	348,056	322,204	*	*	*	*	267.207	235,508
Wisconsin			85,162	65,289	1,692,044	574,917	1,853,425	510,555	38,242	44,824			162,147	36,522
Wyoming					31,267	21,021	96,900	67,000					*	*
Undistributed†	197,970	232,550	73,262	111,407			202,136	61,718	397,678	398,251	11,057	12,356	203,365	138,656
	2,310,828	3,435,646	4,781,765	5,089,969	45,629,207	24,116,772	35,244,544	17,305,750	1,538,046	1,991,962	305,659	362,044	2,413,043	1,544,204
Average value		1.49		1.06		0.53		0.49		1.30		1.18		0.64

*—Included under "Undistributed."
†—Includes items entered as "(*)."

Sand and gravel sold or used by producers in the United States in 1928 by States and uses—Continued

State	Filter Sand		Other Sands		Building Gravel		Paving Gravel		Railroad Ballast Gravel		Total	
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Alabama	----------	----------	*	*	686,554	$ 458,339	893,537	$ 655,640	*	*	3,315,985	$ 1,719,222
Arizona	----------	----------	----------	----------	*	*	*	*	*	*	566,777	282,996
Arkansas	----------	----------	*	*	37,530	37,498	586,902	354,544	533,552	$ 246,814	1,683,384	991,408
California	5,996	$ 11,176	*	*	4,035,343	2,619,234	2,984,654	2,079,737	1,449,044	491,755	15,969,132	8,698,884
Colorado	----------	----------	*	*	201,812	153,467	259,435	189,224	675	510	806,051	605,511
Connecticut	----------	----------	*	*	101,130	102,922	----------	----------	*	*	660,708	479,173
Delaware	5,439	8,025	2,359	$ 2,359	757	1,136	757	1,135	----------	----------	68,615	50,209
District of Columbia	----------	----------	----------	----------	277,178	277,178	184,785	184,785	----------	----------	1,002,126	759,053
Florida	----------	----------	----------	----------	131,074	95,509	126,521	107,760	*	*	894,879	495,875
Georgia	108	648	39,864	41,573	18,877	20,887	27,470	8,035	78	78	744,948	310,569
Hawaii	----------	----------	----------	----------	----------	----------	536	1,608	----------	----------	3,570	10,710
Idaho	----------	----------	----------	----------	22,409	10,753	395,226	262,854	*	*	716,471	326,278
Illinois	*	*	1,814,508	1,022,132	3,182,255	1,573,130	4,475,823	2,069,973	*	*	20,969,331	10,243,555
Indiana	----------	----------	*	*	1,427,388	942,296	2,657,098	1,599,307	2,211,248	874,303	11,086,331	5,375,058
Iowa	*	*	*	*	341,533	333,079	1,013,941	790,344	234,347	98,928	3,423,619	2,094,955
Kansas	----------	----------	87,097	34,073	141,404	62,050	636,830	373,344	19,003	6,006	2,760,277	1,532,399
Kentucky	*	*	*	*	586,652	489,582	403,137	258,690	*	*	2,100,907	1,589,617
Louisiana	----------	----------	*	*	588,935	516,212	608,495	386,091	536,940	328,389	2,310,166	1,503,400
Maine	*	*	----------	----------	22,152	34,773	155,866	90,842	*	*	758,528	348,376
Maryland	----------	----------	----------	----------	221,698	232,689	908,421	1,123,042	----------	----------	2,602,142	2,409,544
Massachusetts	4,346	8,058	*	*	912,356	1,035,208	973,639	671,197	230,614	68,380	3,751,193	2,986,850
Michigan	----------	----------	655,747	112,431	1,959,106	1,248,623	4,870,352	2,582,543	1,965,579	605,068	15,893,090	6,828,431
Minnesota	*	*	*	*	712,897	454,761	946,692	700,166	1,254,752	362,985	4,409,245	2,029,091
Mississippi	----------	----------	----------	----------	231,424	123,113	1,720,706	884,015	713,804	282,790	3,012,291	1,428,548
Missouri	----------	----------	*	*	1,180,406	764,236	885,691	671,440	761,198	194,219	5,251,226	3,248,813
Montana	55	40	72,579	18,456	90,516	72,774	101,694	96,620	1,1T4,111	239,072	1,430,914	465,375
Nebraska	1,960	1,400	*	*	674,186	405,473	758,871	495,332	*	*	2,234,575	1,265,001
Nevada	----------	----------	18,664	2,052	*	*	28,458	57,736	*	*	201,992	150,966
New Hampshire	----------	----------	----------	----------	286,402	58,699	881,997	798,760	80,000	60,000	1,636,621	1,018,547
New Jersey	30,039	87,208	16,373	15,773	623,938	608,795	1,619,789	553,241	26,935	18,626	6,292,636	4,261,390
New Mexico	----------	----------	----------	----------	883	1,400	66,383	53,550	46,467	15,489	187,239	111,296
New York	21,039	14,903	51,713	34,447	4,592,179	3,246,724	1,958,857	1,533,211	268,937	167,830	21,109,864	12,572,634
North Carolina	----------	----------	*	*	*	*	*	*	*	*	971,746	531,092
North Dakota	----------	----------	----------	----------	58,585	53,204	106,882	8,394	421,069	43,301	624,700	135,200
Ohio	5,485	13,411	*	*	1,969,289	1,391,571	2,613,940	1,710,854	2,782,619	1,009,515	14,286,169	9,116,356
Oklahoma	----------	----------	*	*	218,617	149,424	823,033	612,526	735,998	71,764	2,827,810	1,426,258
Oregon	----------	----------	*	*	717,321	388,439	690,112	480,977	*	*	2,441,945	1,453,070
Pennsylvania	----------	----------	29,164	22,118	2,885,858	2,529,239	1,792,826	1,290,846	62,273	13,887	12,995,790	11,289,826

*—Included under "Undistributed."

Sand and gravel sold or used by producers in the United States in 1928 by States and uses—Continued

State	Filter Sand		Other Sands		Building Gravel		Paving Gravel		Railroad Ballast Gravel		Total	
	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value	Short Tons	Value
Rhode Island	....	....	840	$ 150	*	*	159,730	$ 17,870	*	*	192,862	$ 56,610
South Carolina	....	....	*	*	*	*	*	*	*	*	507,716	341,391
South Dakota	....	....	*	*	16,485	$ 13,570	2,164,054	1,185,782	148,899	$ 29,041	2,461,963	1,301,075
Tennessee	....	....	30,984	24,738	586,088	506,118	964,732	728,813	78,382	40,805	2,939,541	2,157,515
Texas	*	*	*	*	1,434,366	1,100,788	1,823,635	1,278,990	2,470,746	869,425	8,007,392	4,602,421
Utah	....	....	....	....	101,617	58,534	375,255	345,475	*	*	1,000,131	544,020
Vermont	....	....	*	*	*	*	39,590	24,789	*	*	295,524	108,461
Virginia	....	....	93,801	43,397	206,380	203,139	442,264	342,209	*	*	1,602,444	1,081,948
Washington	*	*	*	*	1,091,783	403,821	1,620,528	693,814	1,973,683	337,077	5,917,748	2,001,195
West Virginia	....	....	....	....	307,820	276,195	449,969	418,383	119,507	79,725	2,383,659	2,773,341
Wisconsin	*	*	*	*	1,420,901	595,429	3,333,963	1,478,742	1,437,579	339,867	10,104,015	3,680,420
Wyoming	....	....	*	*	36,930	37,289	187,500	120,000	*	*	1,742,880	414,004
Undistributed†	39,511	$ 82,027	2,486,954	685,465	406,221	383,908	368,210	324,763	5,867,091	1,410,681	....	....
	113,978	226,896	‡5,400,647	‡2,059,164	34,747,235	24,071,208	49,088,786	30,697,993	§27,545,130	§8,306,330	209,118,868	119,207,937
Average value	....	1.99	....	0.38	....	0.69	....	0.63	....	0.30	....	0.57

*—Included under "Undistributed."
†—Includes items entered as "(*)."
‡—Includes 2,536,623 tons of sand, valued at $704,511, used as railroad ballast, and 758,570 tons of sand, valued at $139,971, used by the railroads for fills, bank widening, and stock car bedding.
§—Includes some gravel used by the railroads for fills and other purposes.

ALABAMA PRODUCERS

Colbert County

Tennessee Valley Sand and Gravel Co., Sheffield. Gravel dredged from the Tennessee River at Sheffield.

Dallas County

Alabama Concrete Products Co., Selma. Quarry at Selma.

Elmore County

Underwood-Walker Co., Birmingham.
Kirkpatrick Sand and Cement Co., Birmingham. Quarry at Jackson's Lake.

Escambia County

Edward Campbell, Flomaton. Quarry at Flomaton.

Etowah County

W. P. Clayton, Gadsden. Quarry at Alabama City.

Franklin County

J. B. Hughes Sand Co., Red Bay. Quarry at Red Bay.
Spruce Pine Sand and Gravel Co., Spruce Pine. Quarry at Spruce Pine.

Jefferson County

J. M. Acton, Trussville. Quarry at Trussville.

Macon County

Georgia-Alabama Sand and Gravel Co., Atlanta, Ga. Quarry at Chehaw.

Madison County

Huntsville Transfer and Building Materials Co., Huntsville. Quarry at Hobbs Island.

Marengo County

Demopolis Lumber Co., Demopolis. Quarry at Demopolis.

Mobile County

Gulf, Mobile and Northern Railroad, Mobile. Quarry at Mobile.
Baker Gravel and Material Co., Mobile. Quarry at Mobile.
Mobile and Gulf Navigation Co., Mobile. Quarry at Pearce's Landing, Tombigbee River.

Montgomery County

Alabama Sand and Gravel Co., Montgomery. Quarry at Pruitts.
Atlantic Coast Line Railway Co., Wilmington, N. C. Quarry at Montgomery.
Central of Georgia Railroad, Savannah, Ga. Quarry at Montgomery.
Montgomery Gravel Co., Montgomery. Quarry at Arrow Head.
Roquemore Gravel Co., Montgomery. Quarry at Montgomery.

St. Clair County

Carreker Brothers Sand Co., Cooks Springs. Quarry at Cooks Springs.
Cooks Springs Sand Co., Cook Springs. Quarry at Cooks Springs.
H. E. Riggan, Cooks Springs. Quarry at Cooks Springs.
L. E. Shurbet, Cooks Springs. Quarry at Cooks Springs.

Tuscaloosa County

Baker Sand and Gravel Co., Tuscaloosa. Gravel dredged from Warrior River.

Walker County

Hager and Kent, Cordova. Quarry at Cordova.

STONE

SUMMARY OF PRODUCTION

The stone of all kinds sold or used by producers in Alabama in 1928 amounted to 1,261,190 tons, valued at $2,197,831, as compared with 1,-238,750 tons, valued at $1,797,375 in 1927, an increase of 1.81 per cent in quantity and 22.28 per cent in value of output. This stone was of three classes: limestone, marble and sandstone. The number of active plants—18—remained the same as in 1927.

The stone sold or used by producers in the United States in 1928 amounted to 133,869,510 tons, valued at $196,820,697, a decrease of 1.8 per cent in amount and 0.92 per cent in value of output from 1927. The number of active plants was 2,675, or 29 less than in the previous year.

LIMESTONE

Production. The limestone sold or used by producers in Alabama in 1928 amounted to 1,167,830 tons, valued at $1,368,315, as compared with 1,164,130 tons, valued at $1,079,137 in 1927, an increase of 0.3 per cent in quantity and 21.1 per cent in value of output. These figures do not include oolitic limestone used as high-grade building stone, which was quarried at Rockwood in Franklin County. In addition to building stone, the limestone quarried in Alabama in 1928 was used for fluxing stone, railroad ballast, road metal, riprap and agricultural limestone. The fluxing stone which amounted to 840,740 tons, valued at $701,970 or 72 per cent of the total output was consumed primarily in the blast furnaces and open-hearth steel furnaces of the state. The railroad ballast amounted to 162,-670 tons, valued at $77,333; crushed stone for concrete and road metal amounted to 79,370 tons, valued at $74,267; riprap amounted to 32,220 tons, valued at $22,969. The remaining 52,830 tons were used for agricultural and other minor uses.

The limestone sold or used by producers in the United States in 1928 amounted to 96,864,650 tons, valued at $110,231,974, as compared with 99,662,270 tons, valued at $112,439,824 in 1927.

MARBLE

Production. The marble sold by producers in Alabama in 1928 amounted to 62,400 tons, valued at $792,841, an increase over 1927 of 66.93 per cent in amount and 18.14 per cent in value. This marble was quarried from Talladega County, and was sold for building and monumental work. The waste and scrap stone was sold for terrazzo, riprap, whiting substitute and furnace flux. The building and monumental stone amounted to 112,580 cubic feet, valued at $735,452, while the marble for other uses amounted to 52,840 tons, valued at $57,389. The building and monumental stone, although only 15.3 per cent of the total quantity, amounted to 92.7 per cent of the total value.

In 1928, marble from Gantts Quarry was used for interior work in the State Bank Building, Chicago, Illinois, and in the First National Bank Building and Penobscot Building, Detroit, Michigan.

The marble sold or used by producers in the United States in 1928 amounted to 579,490 tons, valued at $16,402,986, as compared with 600,060 tons, valued at $15,625,872 in 1927, a decrease of 3.42 per cent in quantity, but an increase of 4.97 per cent in value.

SANDSTONE

Production. The sandstone produced in Alabama in 1928 amounted to 30,960 tons, valued at $36,675, as compared with 37,240 tons, valued at $47,150 in 1927. This tonnage was mostly refractory stone and rubble, although there was a small production of stone for rough construction purposes. The refractory stone was a variety of quartzite known as ganister, which was used in the manufacture fo refractory products, primarily silica bricks.

The sandstone produced in the United States in 1928 amounted to 4,716,530 tons, valued at $10,498,440, a decrease of 6.61 per cent in quantity and 3.87 per cent in value as compared with 1927.

ALABAMA PRODUCERS

LIMESTONE

Cheney Lime Co., Allgood. Quarry at Allgood, Blount County.

East Quarry Co., Glencoe. Quarry at Rock Springs, Etowah County.

C. M. Noble, Anniston. Quarry at Cobb, Etowah County.

Rockwood Alabama Stone Co., Nashville, Tenn. Quarry at Rockwood, Franklin County.

Nashville, Chattanooga and St. Louis Railroad Co., Chattanooga, Tenn. Quarry at Cumberland, Jackson County.

Dolcito Quarry Co., Birmingham. Quarry at Dolcito, Jefferson County.

Republic Iron and Steel Co., Youngstown, Ohio. Quarry at Thomas, Jefferson County.

Sloss-Sheffield Steel and Iron Co., Birmingham. Quarry at North Birmingham, Jefferson County.

Tennessee Coal, Iron and Railroad Co., Birmingham. Quarries at Ketona, Vans and Ensley, Jefferson County.

Alabama Lime and Stone Corporation, Birmingham. Quarry at Varnons, Shelby County.

MARBLE

Madras Marble Corporation, Sylacauga. Quarry at Sylacauga, Talladega County.

Moretti-Harrah Marble Co., Sylacauga. Quarry at Sylacauga, Talladega County.

The Alabama Marble Co., Gantts Quarry. Quarry at Gantts Quarry, Talladega County.

SANDSTONE

Harbison-Walker Refractories Co., Pittsburgh, Penn. Quarries at Oxford, Calhoun County and at Rock Run, Cherokee County.

J. Blach and Sons, Birmingham. Quarry at Woodlawn, Jefferson County.

Tennessee Coal, Iron and Railroad Co., Birmingham. Quarry at Trussville, Jefferson County.

MISCELLANEOUS

The *miscellaneous* classification as used in this Bulletin includes asphalt rock, barite, bauxite, beehive coke, building limestone, manganese ore, mica, mineral waters, ocher, pottery and puzzolan cement. The combined value of these minerals and mineral products produced in Alabama in 1928 amounted to $3,490,308. Since the members of this group must be changed from year to year, a comparison of values for different years is of little significance.

Except by special permission, the production of a mineral or mineral product is not published independently unless there are three or more producers, but in order to include these in the state total, their combined values are given under *miscellaneous*. The reason for this practice is obviously to conceal the output of the individual producers, but at the same time to include the value of their products in the state total.

The more important of these products—asphalt rock, bauxite, building limestone and puzzolan cement—are treated in more or less detail in the preceding sections.

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